PAPER TRADE JOURNAL

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD

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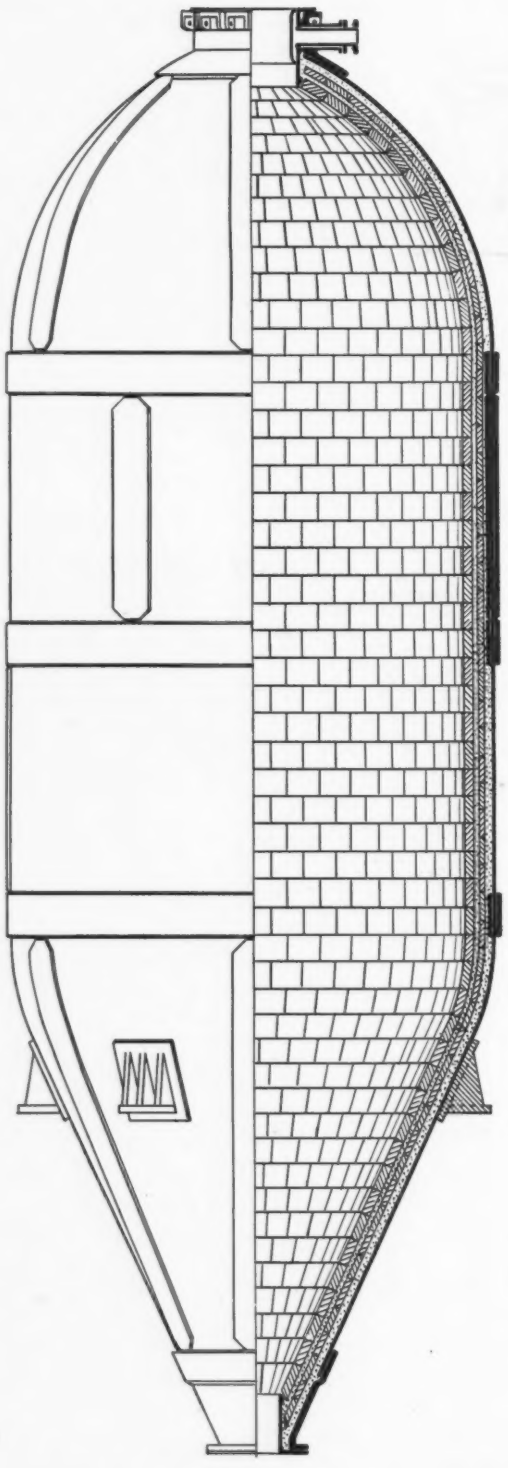
Vol. CV
No. 21



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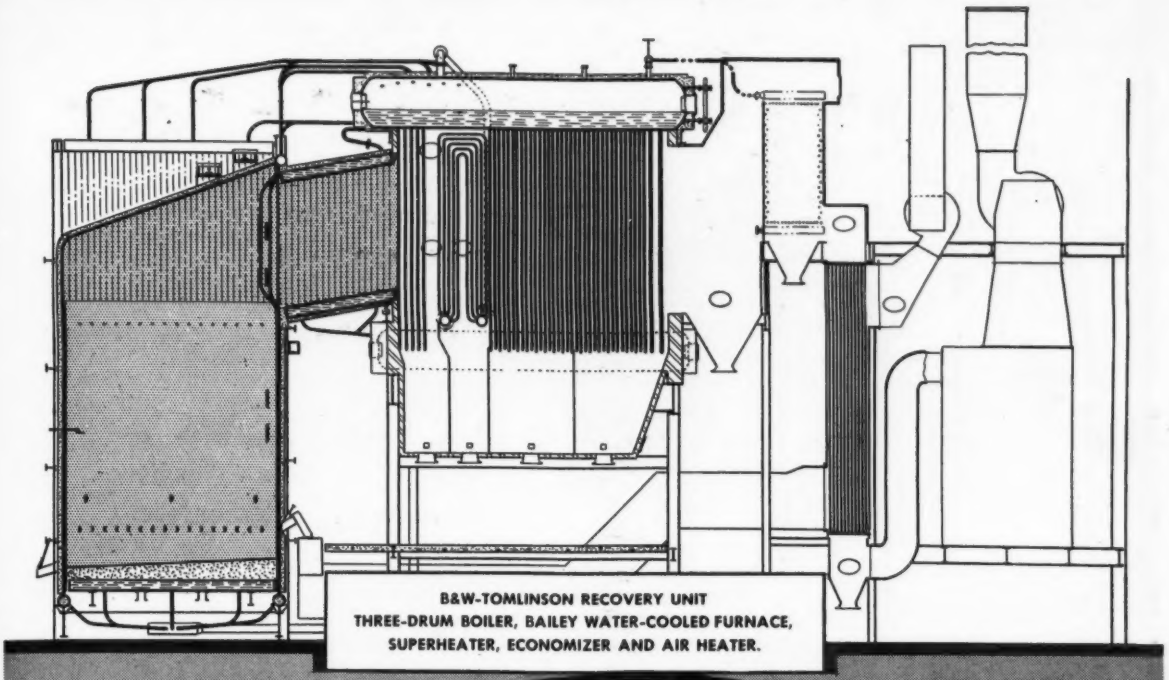

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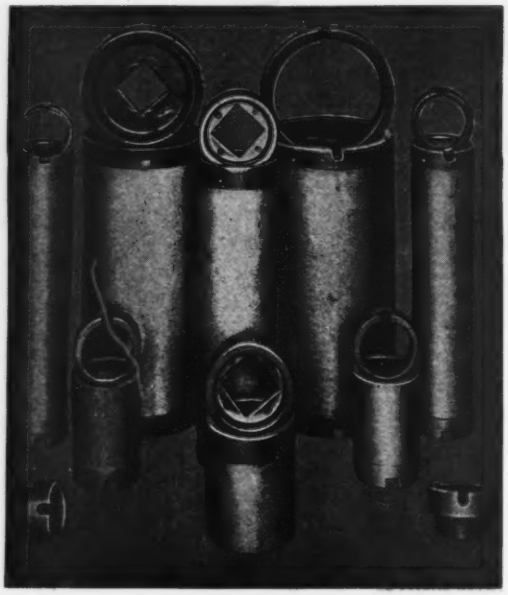

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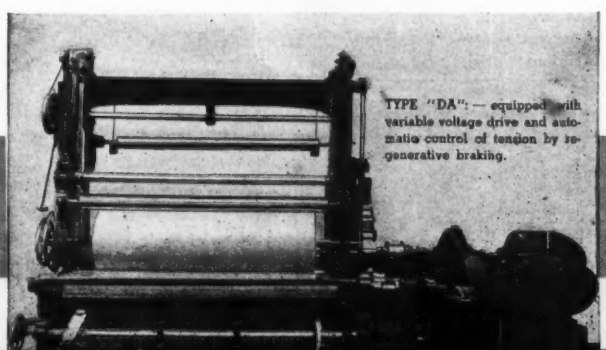

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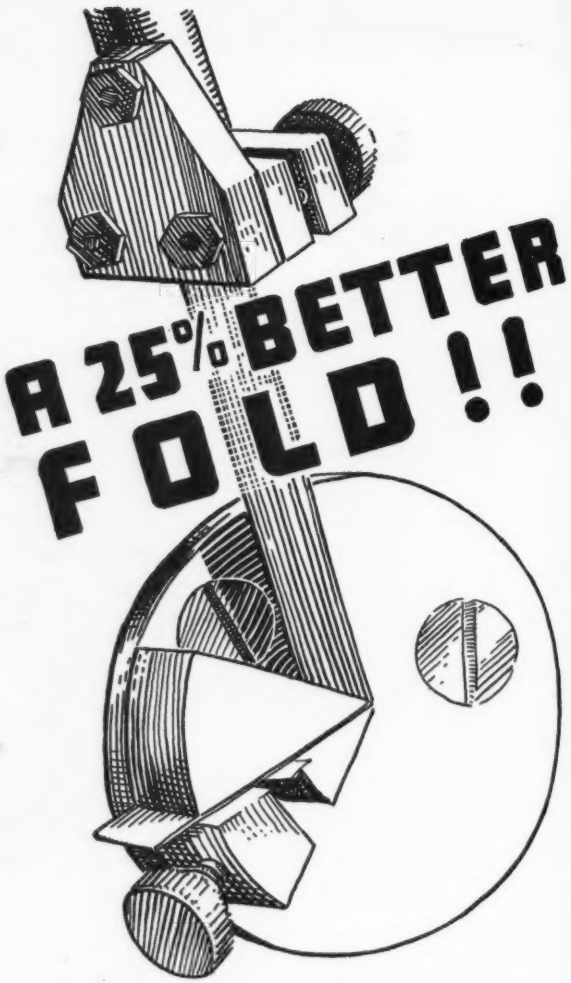

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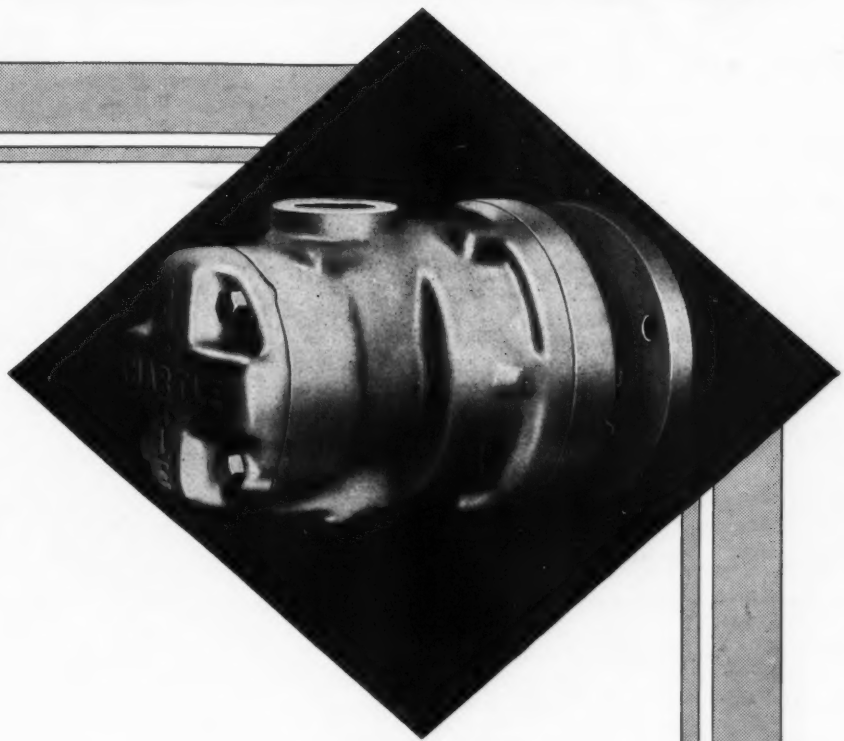

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The Dorr Continuous Recausticizing System has been the choice of over 30 soda and sulfate mills. Over 4500 tons of pulp making capacity are installed or on order. 80 per cent of the new Southern kraft mills have adopted it.

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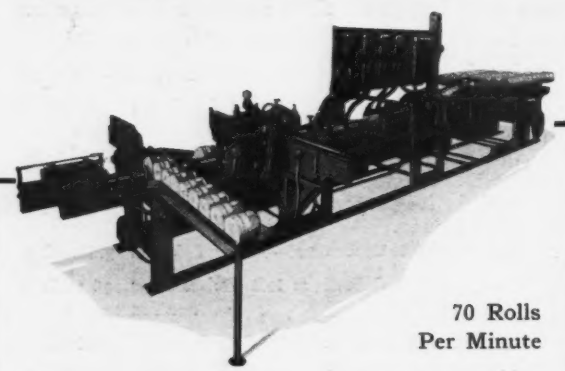

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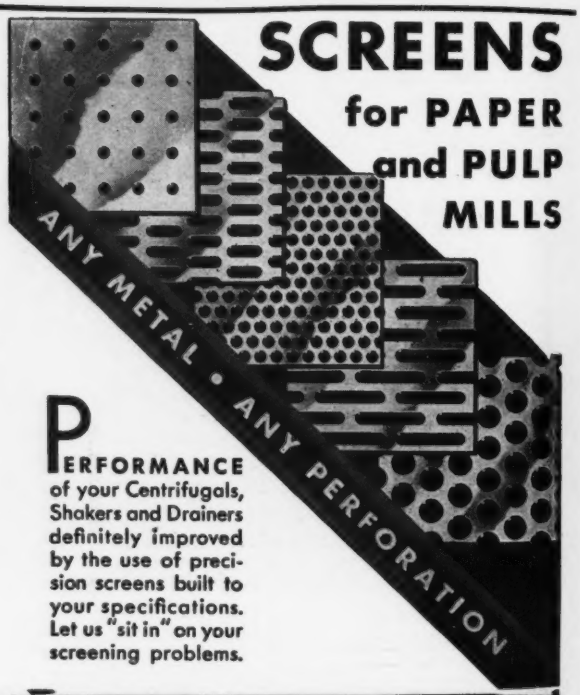

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Soundview Pulp Company's mill at Everett, Washington

PENNSYLVANIA SALT
Chemicals

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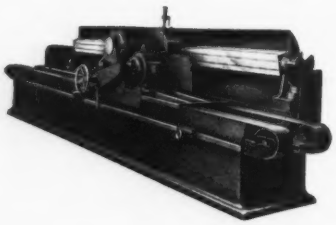

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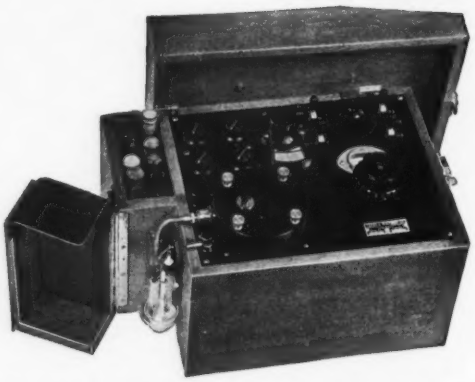

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PAPER TRADE JOURNAL

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD

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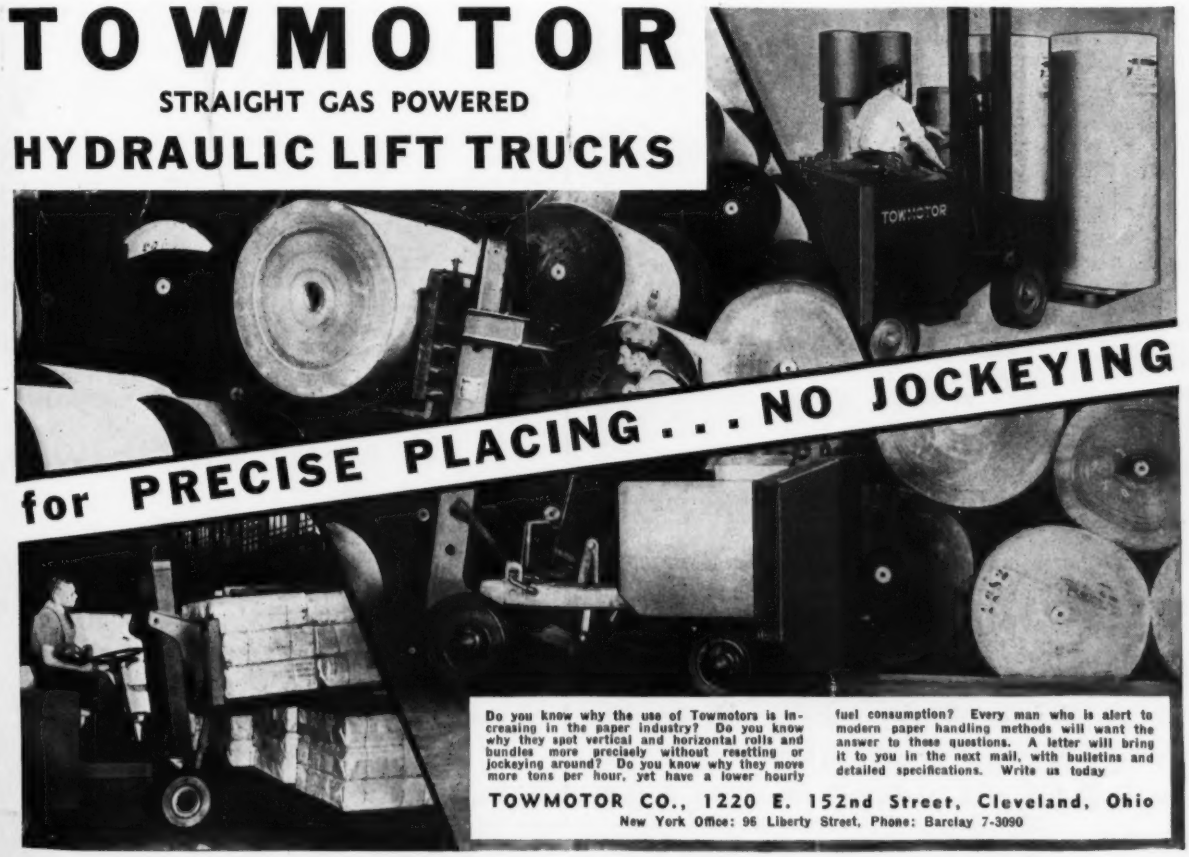

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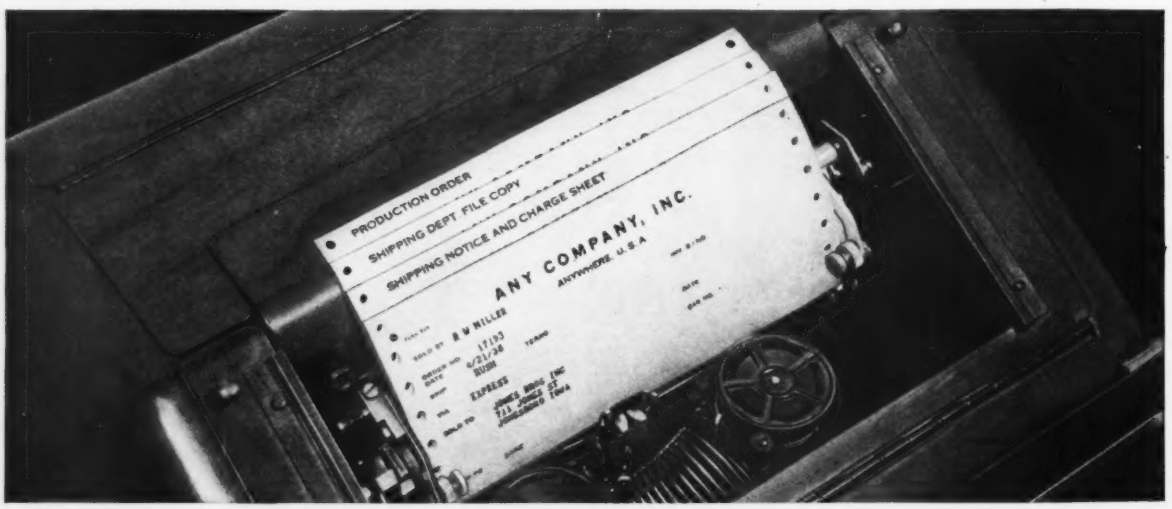

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Established Feb. 17, 1899
Consolidated Nov. 16, 1899
with Paper Trade Journal.

Vol. CVI, No. 21 — Thursday, May 26, 1938

Established Sept. 21, 1918
Consolidated Feb. 19, 1925
with Paper Trade Journal.

Joint Printing Committee Awards Contracts

Concerns Are Announced Which Will Supply The Government Printing Office With Paper For The Six Months Period Beginning July 1—Some Low Bids Tied; In Such Cases Paper Will Be Bought In Open Market.

WASHINGTON, D. C., May 25, 1938 — The Joint Congressional Committee on Printing on Monday made awards for paper for use by the Government Printing Office for the six months period beginning July 1, next. Bids were received on May 16.

In a number of lots the low bids were tied and in such cases the Committee did not make any awards but the paper will be purchased later on the open market as occasion arises.

Following are the awards announced on Monday:

No. 1, National Pulp and Paper Company, Inc., (400,000 pounds) 2.425 cents, and Paper Corporation of U. S. (600,000 pounds), 2.995 cents.
No. 3, Old Dominion Paper Company, 6.09 cents.
No. 4, Old Dominion Paper Company, 6.09 cents.
No. 5, Old Dominion Paper Company, 6.09 cents.
No. 6, Graham Paper Company, 5.51 cents.
No. 7, Graham Paper Company, 5.51 cents.
No. 8, Graham Paper Company, 5.51 cents.
No. 9, Graham Paper Company, 5.51 cents.
No. 10, Graham Paper Company, 5.50 cents.
No. 11, No award.
No. 12, Butler Company, 5.49 cents.
No. 13, Paper Corporation of U. S., 5.608 cents.
No. 14, No award.
No. 15, Paper Corporation of U. S., 5.845 cents.
No. 16, Butler Company, 5.79 cents.
No. 17, Paper Corporation of U. S., 5.845 cents.
No. 18, No award.
No. 19, No award.
No. 20, Whitaker Paper Company, 8.41 cents.
No. 21, Whitaker Paper Company, 8.41 cents.
No. 22, Whitaker Paper Company, 8.31 cents.
No. 23, R. P. Andrews Paper Company, 10.03 cents.
No. 24, Lee Paper Company, 15.89 cents.
No. 25, Lee Paper Company, 15.64 cents.
No. 27, Old Dominion Paper Company, 5.89 cents.
No. 28, Old Dominion Paper Company, 5.75 cents.
No. 29, Old Dominion Paper Company, 5.70 cents.
No. 30, Old Dominion Paper Company, 5.41 cents.
No. 31, Old Dominion Paper Company, 5.41 cents.
No. 36, Butler Company, 6.79 cents.
No. 37, No award.
No. 40, Whitaker Paper Company, 9.02 cents.
No. 43, Cauthorne Paper Company, Inc., 5.41 cents.
No. 44, Barton, Duer & Koch Paper Company, 6.14 cents.
No. 47, Aetna Paper Company, 6.232 cents.
No. 51, R. P. Andrews Paper Company, 9.88 cents.
No. 52, R. P. Andrews Paper Company, 9.05 cents (white); 9.65 cents (blue).
No. 53, Whitaker Paper Company, 11.45 cents.
No. 55, Cauthorne Paper Company, 5.438 cents.
No. 56, Cauthorne Paper Company, 5.188 cents.
No. 57, R. P. Andrews Paper Company, 5.92 cents.
No. 58, Cauthorne Paper Company, Inc., 5.228 cents.
No. 59, Paper Corporation of U. S., 5.261 cents.
No. 60, Paper Corporation of U. S., 7.398 cents.
No. 61, Cauthorne Paper Company, Inc., 5.974 cents.
No. 63, Barton, Duer & Koch Paper Company, 19.65 cents.
No. 64, R. P. Andrews Paper Company, 7.26 cents.
No. 65, Whiting Paper Company, 10.87 cents.
No. 66, R. P. Andrews Paper Company, 12.67 cents.
No. 67, R. P. Andrews Paper Company, 12.43 cents.
No. 69, Barton, Duer & Koch Paper Company, 17.42 cents.
No. 70, Butler Company, 6.517 cents.
No. 71, Butler Company, 7.40 cents.
No. 73, Marquette Paper Company, 17.30 cents.
No. 74, R. P. Andrews Paper Company, 11.69 cents.
No. 75, Marquette Paper Company, 18.90 cents.
No. 76, R. P. Andrews Paper Company, 12.95 cents.
No. 78, Barton, Duer & Koch Paper Company, 26.90 cents.
No. 79, Barton, Duer & Koch Paper Company, 23.65 cents.
No. 83, R. P. Andrews Paper Company, 14.97 cents.
No. 102, Virginia Paper Company, 5.51 cents.
No. 109, Whiting Paper Company, 9.70 cents.
No. 110, Aetna Paper Company, 8.122 cents.
No. 111, Aetna Paper Company, 7.672 cents.
No. 112, Aetna Paper Company, 7.672 cents.
No. 113, R. P. Andrews Paper Company, 7.67 cents.

(Continued on page 28)

New Plan for Control of Newfoundland Mill

Manager of Bowater-Lloyds Indicates Control of International Power & Paper Co's Newfoundland Mill Has Not Yet Been Acquired—New Proposal Submitted to Government—European Pulp and Paper Situation.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., May 23, 1938—Statements published here attributed to H. M. S. Lewin, manager of Bowater-Lloyd (Newfoundland), Limited, indicate that control of the International Power and Paper Company of Newfoundland has not yet passed to the English firm, but is still in process of negotiation. The plan is tied up with a proposal that has been a matter of negotiation for several months between the English firm and the Commission Government of Newfoundland for the erection of a $6,000,000 sulphite mill with a daily capacity of 226 tons, which enterprise would be undertaken in return for timber and tariff concessions.

New Proposal Submitted to Government

Mr. Lewin has now placed fresh proposals before the Government, based upon acquisition of all common shares of the International Power and Paper Company of Newfoundland by the Bowater company, and obtaining the timber limits of the Reid Newfoundland Company, Limited. With the foregoing satisfactorily arranged, the company would be willing to consider: 1. acquisition of the Reid Newfoundland and Company limits; 2. increasing the present capacity of Cornerbrook sulphite mill by 226 short tons daily, and 3. entering into an agreement with Bowater-Lloyd (England) Limited to cut for export a minimum of 50,000 cords of pulpwood for a given period of years. The company would retain export rights mentioned in the draft agreement but forego Labrador concessions.

Referring to the difficulties offered to establishment of a mill in the Gander Lake area, on the northeast coast, as originally proposed, Mr. Lewin said that as an employment project it would make little difference whether the mill were built there or at Corner Brook where it was believed sulphite could be manufactured more cheaply.

European Pulp and Paper Output Curtailed

According to a report of the Bank of Finland just received here, Finland's exports of pulp and paper so far this year has been somewhat below the level of those in the same period last year. The Bank says: "The market for cellulose and paper is sombre. Both buyers and sellers are adopting a waiting attitude, so that scarcely any new contracts of any size have been concluded. The European association of sulphite manufacturers, Sulphite Pulp Suppliers, passed a decision at the beginning of April to restrict sales of sulphite cellulose for this year by 20 per cent in the hope that this would improve the market."

Bank of Norway on Pulp Situation

The Bank of Norway, in its current survey, reports extensive curtailments of production and in some cases actual stoppage of work.

The International Sulphite Cartel, of which Norwegian mills are a member, remains in force up to the end of 1938. No curtailment of production was effected in 1937. Negotiations are at present going on to ensure a prolongation of the agreement.

Meanwhile one of the largest Norwegian operators A. S. Borregaard, Sparpsborg, reports that in the late summer of 1937 a reaction set in and prices of cellulose and paper have since dropped considerably.

In spite of the fact that cellulose and paper industries of Norway, to a large extent, are obliged to effect forward sales over long periods, and have, consequently, only to a limited degree been able to reap the benefit of the high prices of the year, operating results for last year were regarded as satisfactory.

Newsprint Production Decreases

Production of newsprint in Canada during April 1938 amounted to 200,794 tons and shipments to 214,182 tons, according to the News Print Service. Production in the United States was 58,836 tons and shipments 57,348 tons, making a total United States and Canadian news print production of 259,630 tons and shipments of 271,530 tons. During April, 20,896 tons of news print were made in Newfoundland, so that the total North American production for the month amounted to 280,526 tons. Total production in April 1937 was 405,937 tons.

The Canadian mills produced 314,446 tons less in the first four months of 1938 than in the first four months of 1937, which was a decrease of twenty-seven per cent. The output in the United States was 52,058 tons or sixteen and seven-tenths per cent less than in the first four months of 1937, in Newfoundland 26,890 tons or twenty-two and seven tenths per cent less, making a total decrease of 394 tons, or twenty-four and six tenths per cent.

Stocks of news print paper at the end of April were reported at 174,618 tons for Canadian mills and 28,015 tons for United States mills, making a combined total of 202,633 tons compared with 214,533 tons on March 30, 1938.

Japan Imports More Pulp

WASHINGTON, D. C., May 25, 1938—The subject of import quotas in Japan for wood pulp has received a great deal of publicity during the past several months. Unfilled contracts covering imports of rayon pulp from 1937 amounting to 58,023 metric tons were carried over and counted in the 1938 quota. It was subsequently announced that a total of 58,000 tons additional would be allowed importation during the balance of 1938, bringing the total for the year up to 116,000 tons. The total amount of paper pulp to be allowed importation during 1938, according to the monthly trade journal of the Japan Paper Manufacturers' Association, is 53,000 tons, including 30,000 tons carried over from unfilled contracts from 1937 and 23,000 tons of pulp contracted for during 1938.

"Many thanks to you for convincing us that new Bird Screens are virtually a necessity in order to meet present day competition."

That's what one mill manager wrote us just the other day. He says further, **"The installation of these screens was a major step toward economical production, especially at the present time when cost is a vital factor in obtaining business"** . . . Could anything we say give you a stronger reason for finding out, **now,** what new Bird Screens can do to help you get more business? . . . For all the facts, get in touch with

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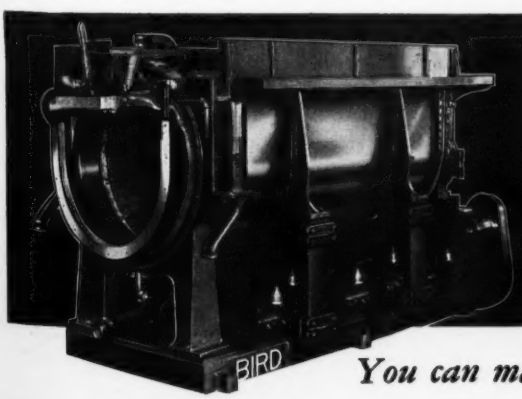

BIRD SCREENS

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Movement to Introduce Paper Milk Packages

Lower Cost of Paper Containers Encourage Manufacturers to Attempt to Overcome Objections of Board of Health—Midwest Paper Trade Off 20 Per Cent From Last Year — Reversal of Wood Pulp Finding Denied.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., May 23, 1938—Of considerable importance to the paper industry, at least certain divisions of it, is the statement that a movement is under way in Chicago seeking to introduce the use of paper milk containers in Chicago. The Board of Health has reported that the health ordinance does not permit the use of paper milk containers and that before action to approve them for use can be taken, paper manufacturers must demonstrate that their products are as sterile as glass bottles and that they will stand up under normal usage. The matter is receiving special attention because several dairies have proposed using the paper containers.

Local reports show that in New York City, where around one third of the milk sold in stores is packed in paper containers, one quart of grade B milk costs 9 cents in the paper container compared to 10¼ cents plus 2 or 3 cents bottle deposit for the same grade of milk in a glass container. Chicago has only grade A milk which meets rigid sanitary requirements and is sold for 12 cents delivered and 11 cents in stores with no bottle deposit except in certain instances. However, in Chicago it is reported that the cost is not as important a factor as the convenience of the paper container, less space requirements, weights, etc.

While the Chicago situation is going ahead, paper milk containers are also being tested for practicability and sanitary conditions by the University of Illinois. The University authorities feel that it will be necessary, eventually, for the paper manufacturers to formulate sanitation rules or to follow rules similar to those followed by standard dairies. It was found, too, that consumers preferred the paper container because of compactness and ease of disposal.

Midwest Paper Demand Declines

The local paper industry took a bit of stock of itself this week and finds business off from last year ranging from 20 to 35 per cent. There is some indication that labor costs are to continue more burdensome and with prices averaging down around 15 per cent the industry shows a genuine need for immediate definite demand. Specifically, there was little of importance in the local markets during the week with demand in general being very slow and the industry reflecting an uncertainty over the business outlook that has stopped most buying except of the most staple and necessary variety. This situation is particularly noted in the fine paper field and with respect to merchandising papers, though some concerns continue to report a fair demand for quality sulphite bond output. The book market is reported as slow with the mills in a less satisfactory position than for some time. Cover markets are likewise dull. Kraft markets are uneven though the industry gives no intention of going into the doldrums over the outlook. Groundwoods and newsprints remain the same and waste paper markets continue to be in a chaotic state. Retail demand in the Chicago areas has been slackened both by weather conditions and by the business picture.

S.A.P.I. Golf Prize Winners

Graham G. Olson, chairman of the golf committee of the midwest division Salesmens Association of the Paper Industry, has reported the list of prize winners at the opening golf outing held at Sunset Ridge Country Club last week. The low gross prize was won by Courtney Reeves who refused the prize because he was playing over his home course. The prize was then drawn for by lot and won by Fred Roll. Other prize winners were as follows: blind bogey, L. D. Koebele, Dwight Bros., low net (17 and under) Raymond Freeman, Bradner Smith & Company; low net (17 and under), Paul Wesco, Fox River Paper Company; low net (18 and over), Bill Baker and R. C. Swan of the Champion Paper Company. The low net for the first nine went to L. D. Koebele and for the second nine to J. R. Rye of the International Paper Company. Ray Odman won the prize for low putts on the first nine while Warren Moore of the Brown Company won similar honors for the second nine. The high gross foursome was composed of Elmer Schmidt, International Paper Company; J. R. Rye; Creighton Whiting, American Writing Paper Company and Bob Wilke, Leader Card Works. The low net foursome was composed of Bill Baker, F. Hagarty, Fred Roll and Courtney Reeves. The next outing will be held at the Westmoreland Country Club, Wilmette, on Friday, June 10.

Refuses Reversal of Woodpulp Finding

Of some effect to Chicago centers is the statement that the Interstate Commerce Commission has issued a new opinion following reconsideration of the complaint of the Columbian Paper Company against various official territory carriers dealing with rates on wood pulp from Virginia and Tennessee points to official territory points in Wisconsin. In January the commission entered a finding stating that rates on wood pulp from the origin point would be unreasonable for the future if the exceeded 22.5 per cent of the corresponding first class rates prescribed in eastern class rate investigation. On April 21 the carriers established the required rates on this traffic. Petition for reconsideration was filed seeking a reversal of the finding that the assailed rates were not unreasonable in the past. The commission refused to uphold the petition for reversal.

Swigart Lists New Lines

The Swigart Paper Company this week issued a complete new set of pages in its current price list. Included in the presentation were a long list of new lines and items including Hurlbut Audubon Deckle Edge, Strathmore Fiesta, Detroit Delkote Cover, Miracle Opaque, Strathmore Bond and Bond Opaque, Kieth Art Parchment, Leghorn Manifold, Riegel's Tuf-Tag; Tri-Tab Tabbing Compound; Ajax Drinking Cups; Radnor Deckle Edge Announcements and Swigart's Hardmade Stationery line.

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Ontario Mills Prepare for Peak Production

Large Movement of Pulpwood Under Way in Northeastern Ontario— Supply Considered Practically Inexhaustible — Wage Agreements Adopted By Kenora Mill and in Logging Industry — Other Late News.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., May 23, 1938—Northwestern Ontario paper mills are rushing to their plants thousands of cords of pulp wood to prepare for what is expected to be a peak in their production. These loads are going in by truck, train and team, from the forest areas within many miles radius of the six mills now in operation in the Kenora district of Ontario. The Kenora Paper Mills expect to pile a minimum of 100,000 cords by the end of this month in readiness for the usual drive. The wood is piled high in huge circles in the several bays of Lake of the Woods. Spruce comprises 95 per cent of the pulp wood used by the Kenora mills, the remainder being made up of balsam and poplar. "Free lance" loggers are paid $7.50 a cord for spruce delivered at the mill.

Wood cutting operations have been carried on about the southern section of the Lake of the Woods by the Kenora mills in six separate camps where a total of 900 men were employed during the winter. Some loggers are being paid a monthly wage for cutting, while the majority do piece work, receiving from $1.75 to $2.00 for each cord. The pulp and paper industry has contributed much toward the solution of the unemployment problem in northwestern Ontario. Out of a total payroll of approximately seven million dollars paid out by the mills in operation last year, the plants at Kenora contributed the sum of one million dollars.

Newsprint and pulp manufactured in 1937 by these mills were valued at $28,000,000. During the past few years great headway has been made in improving the manufacture of paper. New chemical processes have been brought into use which have not only increased the quality of the output, but have created numerous new uses for paper.

Large Reserves of Pulp Wood

According to mill officials, the supply of pulp wood in Northwestern Ontario is practically inexhaustible. Large tracts of forest land have been leased by American interests, of which the mills of Kenora and Fort Frances are subsidiaries. In the English River district, the scene of the recent spectacular gold discovery, thousands of acres of standing timber have not yet been touched. Of the total output of newsprint in Canada last year, Northwestern Ontario's share was 12 per cent, and admittedly the spruce grown in that section of the province is unsurpassed anywhere.

Wages and Hours in Lagging Industry

The schedule of wages and hours has been adopted by the logging industry in the Port Arthur forestry division as a result of a conference recently held. Some of the figures are as follows: Cookees and kitchen staff $40 a month and board; general bushmen and handy men helpers $42.50 for a minimum of 26 days' work per month; loaders, skidders' helpers, feeders of ties, etc., $45 per month; teamsters and skidders $50; teamsters driving less than four horses $50; teamsters driving four horses or more $55; barn boss $55; truck drivers $75, river drivers $2.60 per day, tractor drivers $85; peeled pulp wood cutters on a piecework basis of spruce and balsam, double cord $4, single cord $2.25; sap, peeled wood, double cord $7, single $3.75; jack pine, rough, double cord $2.20, single cord $1.75. All the foregoing figures are minimum wage and board and lodging are included in all the arrangements.

Recent advices from Fort William say that pulpwood operations during the year 1937-1938 were heavier in the Thunder Bay district of Ontario than ever before. It is stated that each company operating took out more wood than it had ever cut in any one season previously. Pulpwood stocks at the present time are very large in that district.

Wage Agreement of 1937 To Be Continued

The Pulp and Sulphite Union Local, No. 92 Fort Frances, Ont., has signed a wage agreement with the Fort Frances Pulp and Paper Co., Limited, whereby the 1937 wage scale schedule will be continued for another year at the base rate of 55 cents an hour for an eight hour day. Negotiations for the Kenora mill were completed at Kenora.

Pulpwood Supply to Erect New Mill

Preparations are being made for the establishment of permanent operating headquarters at Long Lac, Ont., by the Pulpwood Supply Company, Limited, of which J. W. Mc Nutt is resident manager. The Pulpwood Supply Company will construct a mill at Terrace Bay, Ont., and has three survey parties operating out of Long Lac. Work has begun on the erection of several houses for staff officials, a warehouse and an office. Some cutting on the pulpwood limits of the company was done last fall and further activities are expected to get under way within the next few months.

J. S. Hart Delivers Address on Pulp and Paper

John S. Hart, of the staff of the Kenora Paper Mills, Limited, gave an instructive address recently before the Kenora Men's Forum on a "History of Pulp and Paper." He stated that chemical research today is putting the emphasis on cellulose and fifty per cent of the wood is cellulose. From this fifty per cent it is estimated that 10,000 articles in every day use are now being made. These are all from sulphite pulp which Tilgham invented in 1863.

Walsh Paper Co. Shuts Down

CAYUGA FALLS, Ohio, May 28, 1938—The dam and pump house of the Welsh Paper Company, at this place, was washed out by a cloudburst, which occurred on the night of March 18. The mill probably will be shut down because of this accident for five or six weeks for repairs.

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Large Attendance At Graphic Arts Show

More Than 100,000 People Visited Franklin Institute of Graphic Arts and Special Displays of Paper and Paper Making—Statue of Benjamin Franklin Unveiled — Philadelphia Paper and Cordage Association Meeting.

PHILADELPHIA, Pa., May 23, 1938—More than one hundred thousand people visited the Franklin Institute, according to Russell L. Davis, Director of Graphic Arts, during the three-day exhibition from May 19th to 21st, incident to the unveiling of the statue of Benjamin Franklin, during which time special exhibits of paper and paper-making were a feature. Former President Herbert Hoover was guest speaker at a banquet held in the Bellevue-Stratford Hotel, which was the concluding function of the three-day program.

At 5 o'clock on Saturday afternoon, representatives of the Philadelphia Typothetae, the Philadelphia Club of Printing House Craftsmen and paper manufacturers and merchants together with allied groups gathered for the first formal memorial meeting by any organized group in the statue hall.

Paper-Making Exhibit Attracts Interest

More than ordinary interest was manifested in the paper making exhibit, which was described in detail in these columns a few weeks ago, a feature of which was paper making by hand as in Franklin's time. Below, we present a photograph showing the intricacies of this art. John Robertson, the central figure in white cap, is the demonstrator. Mr. Robertson served his apprenticeship and worked for many years in the famous Whatman Mills of W. R. Balston at Maidstone in Kent, England. He came to the United States with Dard Hunter to work in Lime Rock Mill, Connecticut.

What appears to be a strange coincidence is told by Norbert A. Considine, president of the Paper House of Pennsylvania and a former president of the Paper Trade Association of Philadelphia. Mr. Considine was conversing with R. A. Whight, Sales Manager for Crane and Company, when a gentleman standing by said: "This is all very interesting to me; my great great grandfather made that special watermark for Benjamin Franklin when paper was made by hand, and later for the continental currency for the Treasury of the United States, in 1887, whereupon Mr. Whight stated that he was from Crane and Company, who a few years after 1887, operated the old Willcox Mill, and today are making paper for the currency in their Dalton, Mass., mills." The gentleman was R. Ellis Willcox.

Paper and Cordage Men Open Golf Season

The Philadelphia Paper & Cordage Association, Inc., held its first golf tournament of the 1938 season at Pine Valley Country Club, Clementon, N. J., on Wednesday, May 18th. Battling a persistent rain and tricky winds, thirty-six members played golf on this extremely sporting course. E. L. Richards, chairman of the Golf Committee, was in charge and displayed the handsome silver trophy which his company, the Buffalo Envelope Company, is donating at the end of the season, to the player having the best average low net score of the season.

The low gross score was turned in by L. A. O'Neill of Paper Manufacturers Company, whose score was 41-40 for a gross of 81 on an extremely tricky course. Mr. O'Neill was awarded a Lawson-Little golf club. Mr. O'Neill incidentally won the prize for low gross score in 1936, and in 1937 tied with George Hoffner of Simon Walter's, and after a toss-off conceded the honor to Mr. Hoffner. The best low net score of the day was turned in by E. Pomerantz, guest of Charles A. Wilder. Mr. Pomerantz with a score of 89, which with his handicap of 12, gave him a net of 77, was also presented with a Lawson-Little golf club. The Kickers' handicap prize consisting of a box of golf balls was won by W. D. Marshall, who was a guest of W. C. Hamilton Paper Company. In the evening the golfers were joined by a group of others who had journeyed down to climax the day by a very enjoyable dinner at Silver Lake Inn.

Paper and Cordage Assn. Meeting

The regular May meeting of the Philadelphia Paper & Cordage Association was held on Friday, May 20th in the Hotel Adelphia at noon. Chairman E. K. Lay of the Entertainment Committee, announced that the June outing, as has been customary, will be held on June 10th at the Manufacturers Country Club, Oreland, Pa. There will be golf, tennis and quoits for members and their guests, followed by dinner and entertainment in the evening.

At this meeting, Simon Walter, a former member of Council, reported on the status of the City Sales Tax. Mr. Walter said that while nothing definite has been accomplished, the committee is still on the job and it is hoped before long that portion of the tax pertaining to sales outside of the city limits will definitely be repealed.

Joe Miller, president of the Association, then presented R. Donald White, Assistant Credit Manager of the Central Penn National Bank, who was guest speaker. Mr. White, who has been associated with Dale Carnegie in conducting classes in Effective Speech, spoke on the general subject of the value of effective speech in business, and very clearly demonstrated its merit in sales work, citing numerous instances of men having achieved success largely through their ability to sell themselves through effective speech.

Bowater Group Uses More Pulp

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., May 25, 1938—Aktiegolaget Umea Tramassefabriker, which was organized in 1937 to take over the Umea and Sofiehems Tramassefabriker, has announced that after extensive rebuilding the output of their mills has been raised to 125,000 metric tons of wood pulp per annum, according to a report from the office of the Commercial Attache, Stockholm. All of the pulp ground by this company, which is owned by the well known English Bowater group, is utilized in the paper mills belonging to this group.

Northwest Pulp Mill Superintendents Meet

Spring Meeting of American Paper & Pulp Mill Superintendents Held at Mason Lake, Wis.—New Mills in South Not Considered a Menace to Wisconsin Paper Mills—Paper Institute Holds Conference—Other News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., May 23, 1938—The spring meeting of the Northwest division of the American Paper and Pulp Mill Superintendents Association was held Saturday, May 14, at Mason Lake resort, near Park Falls, Wis., home of the Flambeau Paper Company. There was an attendance of 120 superintendents and guests.

At the business session Saturday morning, the following addresses were given: "Paper Machine Variables," by W. E. Johnson, superintendent of Hoberg Paper Mills, Inc., Green Bay, Wis.; "Practical Mill Identification of Dirt in Pulp and Paper," by Leonard Parkinson and Walter Sherman of the Flambeau Paper Company; "A Good Method of Handling Pulp and Paper for High Quality Finished Product," by W. A. Ritchie, superintendent of the Marathon Paper Mills Company's mill at Ashland, Wis.

The afternoon was spent in golf at the Park Falls Country Club, in trap shooting, and in a tour of the Flambeau mills. Superintendents winning at golf were R. J. Le Roux, low gross; John Hanson, low net, and Frank Timmerman, high gross. E. C. Jacobi was high in the trap shoot.

At the closing banquet Saturday evening, S. E. Tomczak, chairman of the division, introduced R. M. Radsch of the Appleton Machine Company, Appleton, Wis., as toastmaster. A welcome was extended by Mayor O. H. Robinson of Park Falls. The speaker was W. A. Munro, president of the Flambeau Paper Company. He pointed out that the superintendents are a strong factor in meeting the competition of Canadian mills and the new mills in the South, by developing better grades of paper. Newsprint, he said, furnishes the foundation price for all grades of paper, and if it is sold profitably, then all other grades also can be sold at a profit.

R. L. Eminger, secretary of the American Paper and Pulp Mill Superintendents Association, gave a short talk outlining the plans for the 1938 convention at Toronto, Canada, in June. Local musicians furnished the banquet entertainment. During the day the "German" band of the Flambeau Paper Company serenaded the visitors.

Forty of the superintendents stayed over for a fishing trip on Sunday on the Flambeau River, one of the most popular in Wisconsin. Although forewarned by Mr. Tomczak of a possible ducking, two of the boats overturned in attempting to negotiate the rapids. The jaunt wound up with a stag dinner in the evening at the Park Falls Country Club.

Effect of Mills in South on Western Production

Some interesting views have been expressed by experts as to the effect on Wisconsin mills of the increasing number of new paper mills being erected in the South. The prevailing opinion seems to be, however, that aside from the diminishing of kraft production in the North because of its greater adaptability to southern woods, the manufacturers are not particularly concerned.

"No matter what happens in the South," says Westbrook Steele, executive director of the Institute of Paper Chemistry, Appleton, Wis., "there is little danger of the mills in the North being closed down for many years at least. There is no other industry in which the investment is so great per ton of finished product, and there are few in which equipment can be converted so easily from the manufacture of one type of product to another.

"Wisconsin has gone through other transitions. There was a time when newsprint was the principal product of the state's paper mills. Spruce was and is the principal ingredient of newsprint. But as the spruce in the state was thinned out and it became necessary to ship it to the mills from greater and greater distances, there came a time when newsprint no longer could be produced profitably in quantities here. But by that time there was a growing demand for kraft papers. And it was no trick at all to begin turning those out on the machines that had been making newsprint. Even before southern competition became an important factor in the kraft field, many of the Wisconsin mills already were turning to other products. This state has been making high grade book and bond papers, and in recent years has been turning out more and more specialties."

R. N. Cunningham and H. G. White, of the lake states forestry experiment station at St. Paul, Minn., say: "There is every reason for seeking means of stimulating spruce yields from Wisconsin's own forest lands. Balsam fir, although not so highly prized as spruce, is a reasonably satisfactory substitute for manufacture of many types of paper. The Wisconsin mills appear to be consuming slightly greater quantities every year.

"Hemlock ordinarily makes up a fairly large share of the annual wood consumption of the state's pulp mills. The available volume of hemlock exceeds the combined volume of spruce and balsam fir three to one in Wisconsin. Wisconsin's pulp mill requirements therefore are not likely to exhaust the locally available hemlock supplies in the near future.

"Jack pine, the species most commonly used in kraft paper production, is also of limited extent in Wisconsin. The only pulp species which shows any excess of supplies is aspen. Technical and economic considerations permitting, here would be one large dependable source of wood.

"The forestry inventory shows that Wisconsin has nearly 17,000,000 acres of forest land. About 10 per cent, or 1,628,000, of this is land already stocked to spruce, balsam fir and jack pine. If it were reasonably productive and yielded one-third cord per acre per year, annual supply of more than 540,000 cords of the soft woods would be assured. Under constructive management, Wisconsin forests could be made to yield about 700,000 cords, or 75 per cent more than they are yielding at the present time."

J. M. Walley of the Regional U. S. Forestry office at Milwaukee, Wis., says few of the Wisconsin mills nowadays attempt to cut pulp wood from their own

lands. Many of them contract with farmers and settlers living near their lands to take out the wood and haul it to the mills or to railroad sidings. Wisconsin ships in two-thirds of its pulpwood from Minnesota, Michigan and Canada. Out of a total consumption of 1,119,089 cords of pulp wood last year, the state imported 264,517 cords from Canada, 389,913 cords from Minnesota, 61,325 from Michigan, and produced only 403,334 cords itself.

Mill Executives at Paper Institute Meeting

One-hundred twenty-five paper mill executives from all parts of the United States attended the third annual conference at the Institute of Paper Chemistry, Appleton, Wis., Thursday and Friday, May 19 and 20.

The opening morning was devoted to a tour of the Institute buildings, where the visitors saw the students at work, and heard candidates for M. S. and Ph.D. degrees discuss their work and their theses. A noon luncheon was held at North Shore Country Club at which talks and papers were given by Dr. B. W. Rowland and Dr. Harry F. Lewis of the Institute staff. Dr. Rowland spoke on colloid chemistry and Dr. Lewis on organic chemistry.

Discussions on the Institute's general research program occupied the Friday morning session, conducted by Emil Heuser, J. A. Vanden Akker and H. W. Morgan, of the staff. Another luncheon was held at noon at which Dr. Otto Kress, technical director, and Westbrook Steele, executive director were the speakers.

The conference closed with a banquet Friday evening at the North Shore Country Club, presided over by Dr. Thomas N. Barrows, president of Lawrance College and director of the Institute. The speaker was the Hon. Philip F. La Follette, governor of Wisconsin. His talk was an informal, conversational and "off the record" presentation of the state's desire to cooperate with the industry through its newly created department of commerce, headed by W. F. Ashe, former personnel director of the Thilmany Pulp and Paper Company, and the state's attempt to bring about better employer-employee relations through its labor relations board.

Simplified Practice for Laundry Boxes

WASHINGTON, D. C., May 25, 1938—A proposed simplified practice recommendation, covering sizes and caliper thicknesses of stock folding boxes for laundry, has been mailed to the producers of stock folding boxes, the laundries, and others interested, by the Division of Simplified Practice of the National Bureau of Standards for consideration and approval.

This recommendation for stock folding boxes for laundry was developed by the Folding Paper Box Association of America, based on the results of a variety survey of types and sizes of boxes available for the purpose indicated.

The adoption of this recommendation by the stock box manufacturers, the laundries, and others interested should result in advantages to all concerned.

The simplified list of recommended types and sizes of stock folding boxes, when approved by the industry, will be promulgated by the Department of Commerce, effective from a date to be announced later.

Obituary

Lewis L. Alsted

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., May 23, 1938—Lewis L. Alsted, president of the Combined Locks Paper Company, Appleton, Wis., died unexpectedly at 1:30 Saturday afternoon, May 21, at a hospital in Chicago. He had been ill for several days with pneumonia.

Mr. Alsted headed the company for mone than twenty years, and was prominently known among paper mill executives. He was of a modest type, and took no prominent part in business or civic activities, yet was noted for his interest in charity and community enterprises, which he supported quietly but liberally. He was a graduate of the University of Wisconsin, and a member of All Saints Episcopal Church of Appleton.

The survivors include the widow and one daughter, Mary, a student at Northwestern University, Evanston, Ill.

Edward E. O'Keefe

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., May 23, 1938—One of the builders of numerous paper mills in the earlier days, Edward O'Keefe died at his home at Appleton, May 18, after an illness of several months. He was 83 years old.

Mr. O'Keefe was a widely known construction engineer. He was born May 12, 1855, at Green Bay, Wis., and came to Appleton when nine years old. He attended the public schools and Lawrence College, and in 1882 became associated with the late Thomas W. Orbison in the engineering firm of O'Keefe and Orbison. The company designed and constructed the original mill of the Interlake Pulp and Paper Company division of the Consolidated Water Power and Paper Company at Appleton, the Thilmany Pulp and Paper Company and the Union Bag and Paper Company mills at Kaukauna, Wis., the Combined Locks Paper Company mills at Combined Locks, and others, the operations of the company extending as far as Maine. The concern was a leading consultant on hydro-electric and hydraulic projects. Mr. O'Keefe supervised construction of the world's first hydro-electric plant at Appleton, a small generating plant, a replica of which stands today on the grounds of the Wisconsin Michigan Power Company.

The decedent was the oldest living member of the Elks lodge of Appleton. He was also a member of the Catholic Knights of Wisconsin, of the Holy Name Society and St. Mary's Church. One daughter and four sons survive him.

Funeral services were held at St. Mary's church at Appleton, and burial was made in the parish cemetery.

MacAllister Represents Jas. White

P. L. MacAllister is reported to have recently been appointed Milwaukee sales representative of the James White Paper Company, well known Chicago cover firm. Mr. MacAllister is located at 209 E. Michigan, Milwaukee, and has had many years of experience in servicing the paper and printing trade in the Wisconsin city and in surrounding territory.

Financial News of Pulp and Paper Industry

Price Bros. Report Increase in Earnings—Abitibi Profits Up in April—Eddy Stockholders Vote Increased Capitalization — Dominion Envelope Earns $10.61 on Mortgage Shares in 1937 — Other Financial News.

NEW YORK STOCK EXCHANGE

High, Low and Last for the Week Ending May 25, 1938

	High	Low	Last
Armstrong Cork Co.	28⅜	26½	26½
Celotex Corp.	17½	17	17
Certain-Teed Products Corp.	6⅜	5½	5½
Certain-Teed Products Corp., pf.	24¼	24	24
Champion Paper & Fibre Co.	19½	19½	19½
Congoleum-Nairn Co.	17	16½	16⅝
Container Corp. of America	10⅞	10	10
Continental-Diamond Fibre Co.	6½	6½	6½
Crown-Zellerbach Co.	9¼	8⅜	8⅜
Crown-Zellerbach Co., pf.	65⅜	63¾	63¾
Flintkote Co.	15⅜	14½	14½
Robert Gair	3¼	3	3
Robert Gair, pf.	11	11	11
International Paper & Power	7⅛	6¼	6¼
International Paper & Power, pf.	29	26⅛	26⅛
Johns-Manville Corp.	70	65	65
Kimberly-Clark Corp.	21	21	21
Masonite Corp.	30	28¾	28¾
Mead Corp.	9½	9	9
Paraffine Companies, Inc.	33	30	30
Ruberoid Co.	18¾	18	18
Scott Paper Co.	40½	40	40½
Sutherland Paper Co.	22¼	22	22
Union Bag & Paper Corp.	9⅝	8¾	8¾
United Paperboard Co.	4¼	4⅛	4⅛
U. S. Gypsum Co.	72⅞	68	68

NEW YORK CURB EXCHANGE

High, Low and Last for the Week Ending May 25, 1938

	High	Low	Last
American Box Board Co.	6¾	6¾	6¾
Brown Co., pf.	21	21	21
Great Northern Paper	27½	27¼	27½
St. Regis Paper Co.	2⅞	2⅝	2¾
Taggart Corp.	4¾	4⅝	4⅝

Price Bros. Financial Report

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., May 23, 1938—The financial statement of Price Brothers and Company, Limited, for the fiscal year ended March 31, 1938, shows a further wide expansion in earnings and an increase of about $1,250,000 in net working capital. Total income for the year was $2,884,013, as compared with $1,805,862 for the preceding year, and after all charges, including bond and debenture interest, depreciation, depletion and income taxes, there was a net profit on the year of $500,228, as compared with net loss of $293,913 in the preceding year and a net loss of $1,595,625 in the fiscal year ended March 31, 1936. Net profit was equal to $7.95 on the 5½ per cent preferred, and after deduction of an amount equivalent to a year's dividends, the balance was equal to 28 cents a share on the common. This is the best showing made by the company since the fiscal year ended February 28, 1931.

The balance sheet shows current assets of $13,947,991, against $6,137,519 in current liabilities, leaving net working capital of $7,810,472. A year ago net working capital stood at $6,599,189. Among balance sheet items, inventory has risen from $5,473468 to $8,168,026, while bank loans stand at $5,150,000, against $2,877,000. Second mortgage debentures outstanding are shown at $3,936,800, against $4,268,300, while total common outstanding has accordingly risen to $547,857 shares from 536,807 outstanding a year ago. Total assets at $61,873,261 compare with $59,321,287 a year ago.

In presenting the report to shareholders, President C. H. L. Jones states that "during the year the company completed the transaction of taking over Price House (the fine new building erected for the company in Quebec City) and as a result it is now included with the fixed assets." President Jones also states that "during the year an amicable settlement was reached with Saguenay Power Company in respect of all outstanding matters in connection with the power contracts between the companies."

Abitibi Earnings Up in April

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., May 23, 1938—G. T. Clarkson, receiver and manager of the Abitibi Power & Paper Company, Limited, Toronto, reports that the earnings of the company, prior to charges for depreciation and bond interest for the month of April, 1938, amounted to $181,932 as compared on a similar basis with $140,258 for March, 1938, and $362,653 for April, 1937. Present indications are that shipments of newsprint in May will exceed 25,000 tons. Shipments of newsprint in April amounted to 22,001 tons as compared with 18,239 in March last and 36,320 in April, 1937. Shipments of bleached sulphite pulp in April were 2,841 tons as compared with 2,135 tons in March and 5,687 tons in April, 1937. It is expected that shipments of bleached sulphite pulp in May of this year will exceed 2,600 tons.

Dominion Envelopes Profits $44,898

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., May 23, 1938—Dominion Envelope and Cartons (Western) Limited, report that the net income for the year ending 1937, amounted to $44,898 equal to $10.61 a share on the 4,230 first mortgage shares outstanding, as compared with $44,321 and $10.48 a share in 1936. Dividends of $8 a share were paid on the first preferred during the year. At December 31, 1937, dividend arrears on first preferred amounted to $16 a share and on the second preferred to $52.50 a share. The net working capital increased from $172,937 at December 31, 1936, to $207,288.

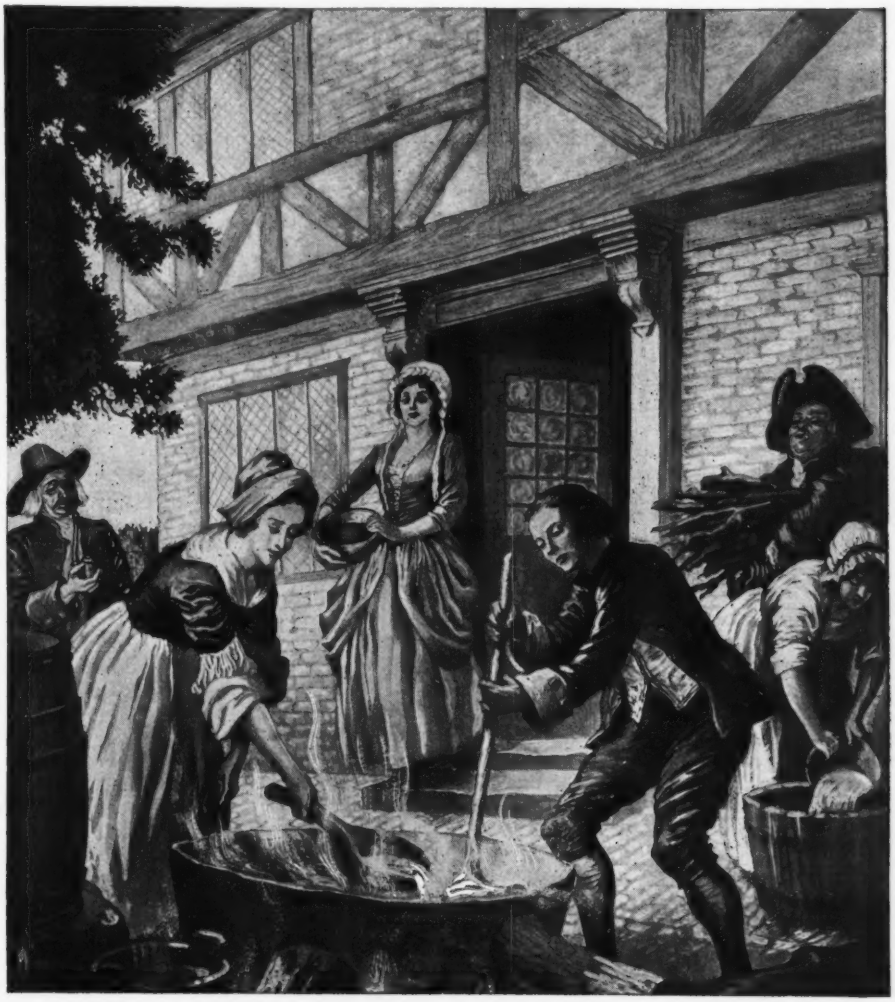
Eddy Paper May Defer Dividend

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., May 23, 1938—The Eddy Paper Corporation may not make a dividend disbursement for the second quarter of the year as directors this week took no action on a June dividend payment. The company has paid dividends at three month intervals since 1935 and a dividend of 20 cents a share was paid on March 31 of this year. At the same meeting described above, announcement was made that the transaction involving the acquisition of the common

Through the Centuries with Alkalies

In the American Colonies soap-making was at first largely a household art. The housewife saved the wood-ashes (soda) from the great fireplaces and the grease from the kitchen. By pouring water over the ashes lye was made. The lye and grease were then boiled together until the compound was strong enough to hold up an egg. This strong soft soap was kept in a wooden soap box in the kitchen where it was available alike for Saturday night baths and the family laundry. Later on caustic soda was bought at the grocer's and mixed with hot fat and grease for the home-made soap.



Such resourcefulness and thrift as the Colonial housewife practiced is of vital importance to American business today. In the face of mounting costs and heavy taxation, executives are checking sources of supply with great care and buyers of raw materials are testing quality as never before. As a supplier of Soda Ash, Caustic Soda, Bicarbonate of Soda, Modified Sodas, Calcium Chloride and Liquid Chlorine, serving many major industries, The COLUMBIA ALKALI CORPORATION welcomes this challenge and this responsibility. Its officers and staff pledge themselves anew to deliver the utmost in product, value and service.

SODA ASH
CAUSTIC SODA
SODIUM BICARBONATE
MODIFIED SODAS
LIQUID CHLORINE
CALCIUM CHLORIDE

COLUMBIA

THE COLUMBIA ALKALI CORPORATION

BARBERTON • OHIO

NEW YORK CHICAGO BOSTON PITTSBURGH
CLEVELAND CINCINNATI ST. LOUIS MINNEAPOLIS

stock of the Rochester Folding Box Company would be consummated by June 1. Eddy paper business for the first four months of 1938 was about 35 per cent off from the corresponding period of last year and the outlook was considered sufficiently uncertain to discourage payment of dividends at the present time.

Eddy Stockholders Vote Approval

[FROM OUR REGULAR CORRESPONDENT]

KALAMAZOO, Mich., May 18, 1938—At a meeting of the Stockholders of the Eddy Paper Company held May 17 the proposed amendment to the articles of corporation for an increase in authorized capital, and the issuance of additional shares to purchase the common stock of the Rochester Folding Box Company was approved. The consummation of the transaction is expected on June 1, according to a statement by J. W. Kieckhefer, president of the Eddy Company. This action brings the total shares to 200,000.

Eastern Mfg. Co. Reports Profit

The Eastern Manufacturing Company, which is operating under section 77b of the Bankruptcy Act reported as follows for the March quarter: Profit before provision for deferred bond interest, $30,650, compared with profit last year of $51,788 after deduction of bond interest requirement. Balance sheet dated March 31, shows cash on hand $653,957, compared with $201,808 on Dec. 31, 1937. Current assets totaled $2,993,856 at end of March, compared with $2,628,373 at end of December, and current liabilities were $1,533,127, compared with $1,352,480.

Brown Co. Plans $2,500,000 Loan

[FROM OUR REGULAR CORRESPONDENT]

PORTLAND, Me., May 23, 1938—Trustees of the Brown Company, which is being operated under Section 77B of the Federal Bankruptcy Act, have petitioned the Federal court here for authority to issue not to exceed $2,500,000 of certificates of indebtedness to bear interest at not more than 6 per cent. The certificates are to be a first lien on all the properties of the company. Hearing on the matter will be held on May 27.

Advance Bag Makes Good Report

The Advance Bag and Paper Company, Inc., reported as follows for 1937: Net income, $436,012, equal after dividend requirements on prior lien shares and preferred stock to $14.10 each on 18,272 common shares. Including the Southern Advance Bag and Paper Company, Inc., the net income in 1937 was $824,067, or $35.33 a common share.

R. T. Houk's Estate Valued at $114,293

[FROM OUR REGULAR CORRESPONDENT]

DAYTON, Ohio, May 20, 1938 — The estate of Robert T. Houk of the Mead Paper Company was valued at $114,293.00, according to inventory filed in probate court early last week. The inventory lists real estate at $39,170.00; most of securities are in Mead Corporation stock.

Pacific Coast Paper Merchants Meet

The Pacific Coast paper conference was held this year at Del Monte, Cal., May 12 to 14 inclusive. As the Pacific States Paper Trade Association has been dissolved, the meeting held this year was merely a gathering of papermen for informal discussions.

J. W. Thompson, of Blake, Moffitt & Towne, Seattle, Wash., was elected chairman of a similar informal meeting which will be held next year, and W. B. Reynolds, Los Angeles, Cal., was elected secretary for this meeting.

During the conference, the following talks and addresses were made:—

Study and Use of The National Trade Paper Association's Sales Charts and Statistics, by H. D. Bean, San Francisco.

Report on the February N. P. T. A. Meeting, by O. W. Mielke, San Francisco.

Review of Activity of Merchandising Committee of the N. P. T. A., by J. W. Thompson, Seattle.

Inventory Control-Slow Moving Items, by A. W. Akers, Jr., Seattle.

Educational Program for Salesmen, by C. H. Beckwith, San Francisco.

Traffic Problems, by Ed. Israel, San Francisco.

Salesmen's Compensation, by R. E. LeGrant, Los Angeles.

Sampling, by Arthur W. Towne, San Francisco.

Postal Regulations, by Arthur J. Nelson, Los Angeles.

Buying Trends, by A. Gordon, San Francisco.

Small Order Evil and Small Units in Exchange Business, by F. E. Jefries, Tacoma.

Delivery Costs and Free Delivery Problem.

National Economics, by Harold Mack.

The Every Day Effect of Legislation on Business, by H. Arthur Dunn, Jr., San Francisco.

Employee Relations, by E. A. Breyman, San Francisco.

Tax Matters, by V. G. Gendron, San Francisco.

Necrology Report, by F. C. Stratford, San Francisco.

To Discontinue Carthage Division

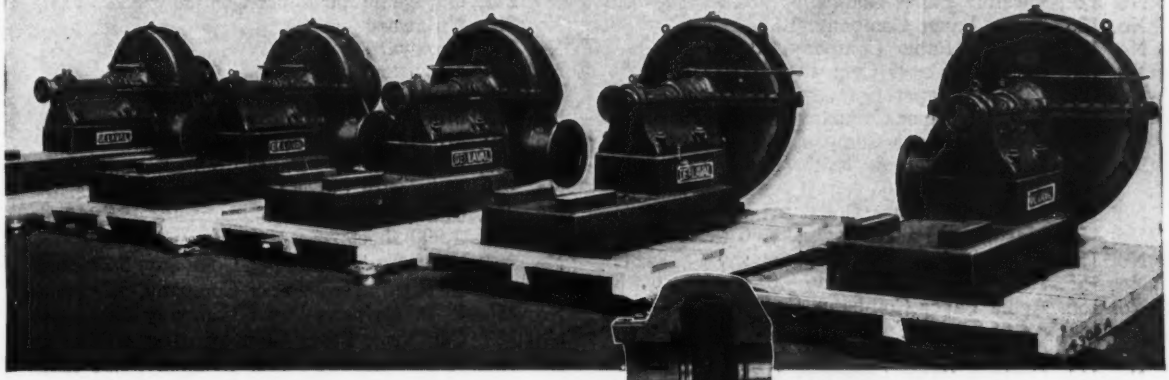
[FROM OUR REGULAR CORRESPONDENT]

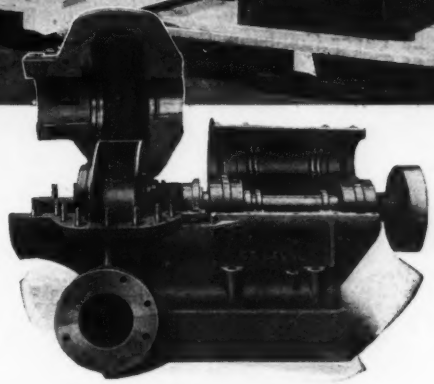
CARTHAGE, N. Y., May 23, 1938—Announcement is made here of a suspension of operations at the Papermakers Chemical division of the Hercules Powder Company. The plant was originally organized in 1922 by local business men as the Adirondack Mineral Company but in 1925 the Papermaker Chemical Corporation took over the plant. In 1934 a merger was effected with the Hercules Powder Company but the plant retained its identity as the Papermakers Chemical division. It has run on full schedule since it started. The manufacturing may be done in Albany although it is not yet definitely decided. It is claimed that production costs would be lessened by the closing due to decreased costs in transportation of raw materials. The plant will continue as a warehouse and distributing plant for the various chemicals and manufactured products which the company handled. The full force will be retained for the present time but in the event no other product is manufactured it is probable that some employes will be discharged.

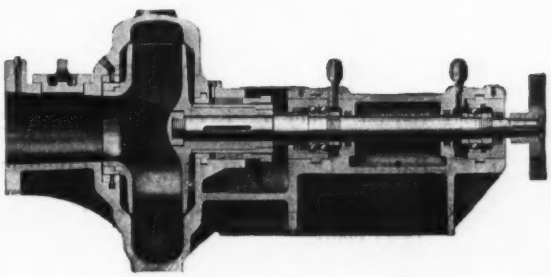
C. J. Slack will continue in charge of the sales territory covered by the division.

DE LAVAL *Clogless* PUMPS

Meet the special and stringent requirements of pumping solids in suspension







1—The passages are wide and free, but proportioned to give high hydraulic efficiency;

2—Immediate access to interior without disturbing piping is provided by the horizontally split casing;

3—Parts of impeller and casing subject to rapid wear are protected by renewable wearing parts; (As all parts are interchangeable on a limit gage basis, these do not require fitting)

4—The construction is heavy, and substantial bearings are used, to give rigid support to running parts;

5—The impeller is designed to have a steep head-delivery characteristic, which tends to prevent clogging;

6—The pump casing and bearings are designed for vertical as well as horizontal mounting.

Ask for Catalog B-1

● Above are shown five of a shipment of seven De Laval Clogless pumps, six of which are designed to deliver 10,400 g.p.m. each against 15 ft. at 294 r.p.m., and one to deliver 7,000 g.p.m. against 27 ft. at 547 r.p.m.

3300

DE LAVAL *Steam Turbine Co.*
TRENTON, N. J.

MANUFACTURERS OF STEAM TURBINES; PUMPS—CENTRIFUGAL, PROPELLER, ROTARY DISPLACEMENT; CENTRIFUGAL BLOWERS AND COMPRESSORS; WORM GEARS; HELICAL GEARS; HYDRAULIC TURBINES AND FLEXIBLE COUPLINGS • • • SOLE LICENSEE OF THE BAUER-WACH EXHAUST TURBINE SYSTEM

Joint Printing Committee Awards Contracts

(Continued from page 13)

No. 114, Whiting Paper Company, 10.10 cents.
No. 115, Whiting Paper Company, 8.30 cents.
No. 116, Aetna Paper Company, 8.072 cents.
No. 117, R. P. Andrews Paper Company, 8.17 cents.
No. 120, Whiting Paper Company, 11.75 cents.
No. 121, Whiting Paper Company, 9.27 cents.
No. 122, Virginia Paper Company, 9.33 cents.
No. 123, Aetna Paper Company, 10.472 cents.
No. 125, Whiting Paper Company, 20.00 cents.
No. 126, Stanford Paper Company, 16.89 cents.
No. 128, Whiting Paper Company, 19.05 cents.
No. 129, Whiting Paper Company, 19.05 cents.
No. 140, Whiting Paper Company, 25.00 cents.
No. 141, Barton, Duer & Koch Paper Company, 19.65 cents.
No. 151, Marquette Paper Company, 6.25 cents.
No. 152, Marquette Paper Company, 6.25 cents.
No. 154, R. P. Andrews Paper Company, 8.57 cents.
No. 155, Aetna Paper Company, 9.012 cents.
No. 156, Aetna Paper Company, 9.012 cents.
No. 157, Aetna Paper Company, 9.532 cents.
No. 160, Graham Paper Company, 9.43 cents.
No. 161, Graham Paper Company, 9.73 cents.
No. 162, Barton, Duer & Koch Paper Company, 9.96 cents.
No. 163, Aetna Paper Company, 9.942 cents.
No. 164, Aetna Paper Company, 10.412 cents.
No. 165, Aetna Paper Company, 10.412 cents.
No. 168, Barton, Duer & Koch Paper Company, 13.73 cents.
No. 169, R. P. Andrews Paper Company, 13.59 cents.
No. 170, R. P. Andrews Paper Company, 13.63 cents.
No. 171, R. P. Andrews Paper Company, 13.69 cents.
No. 172, Barton, Duer & Koch Paper Company, 14.68 cents.
No. 173, Barton, Duer & Koch Paper Company, 14.68 cents.
No. 176, Barton, Duer & Koch Paper Company, 18.47 cents.
No. 177, Barton, Duer & Koch Paper Company, 18.47 cents.
No. 178, Barton, Duer & Koch Paper Company, 18.47 cents.
No. 179, Barton, Duer & Koch Paper Company, 18.47 cents.
No. 180, Barton, Duer & Koch Paper Company, 18.47 cents.
No. 181, Barton, Duer & Koch Paper Company, 18.47 cents.
No. 184, Virginia Paper Company, 5.88 cents.
No. 190, Aetna Paper Company, 9.202 cents.
No. 191, Marquette Paper Company, 12.00 cents.
No. 192, Barton Duer & Koch Paper Company, 9.45 cents.
No. 193, Marquette Paper Company, 12.35 cents.
No. 196, Barton, Duer & Koch Paper Company, 17.60 cents.
No. 197, R. P. Andrews Paper Company, 10.50 cents.
No. 198, No bids.
No. 201, Virginia Paper Company, 7.14 cents.
No. 202, Virginia Paper Company, 7.82 cents.
No. 203, Marquette Paper Company, 7.48 cents.
No. 204, Marquette Paper Company, 7.37 cents.
No. 205, Lee Paper Company, 11.07 cents.
No. 209, Old Dominion Paper Company, 3.987 cents.
No. 210, Old Dominion Paper Company, 3.737 cents.
No. 211, Old Dominion Paper Company, 5.299 cents.
No. 213, No award.
No. 214, No award.
No. 215, No award.
No. 217, Mudge Paper Company, 3.82 cents.
No. 218, Mudge Paper Company, 3.82 cents.
No. 219, Mudge Paper Company, 3.59 cents.
No. 220, R. P. Andrews Paper Company, 5.50 cents.
No. 251, Enterprise Paper Company, 9.36 cents.
No. 252, Cauthorne Paper Company, Inc., $4.845 per 1,000 sheets.
No. 254, R. P. Andrews Paper Company, 5.27 cents.
No. 255, R. P. Andrews Paper Company, 5.27 cents.
No. 256, R. P. Andrews Paper Company, 6.67 cents.
No. 257, Cauthorne Paper Company, Inc., 6.83 cents.
No. 258, R. P. Andrews Paper Company, 5.23 cents.
No. 259, R. P. Andrews Paper Company, 5.23 cents.
No. 260, No. award.
No. 261, No award.
No. 262, No award.
No. 263, Barton, Duer & Koch Paper Company, 7.00 cents.
No. 264, Andrews Paper House of York, Pa., 3.25 cents.
No. 265, No award.
No. 271, Old Dominion Paper Company, 5.299 cents.
No. 276, Barton, Duer & Koch Paper Company, 6.73 cents.
No. 277, Barton, Duer & Koch Paper Company, 7.73 cents.
No. 280, No award.
No. 281, Bartgis Brothers Company, 3.25 cents.
No. 302, Barton, Duer & Koch Paper Company, $22.00 per 1,000 sheets.
No. 303, Barton, Duer & Koch Paper Company, $33.30 per 1,000 sheets.
No. 304, Barton, Duer & Koch Paper Company, $44.90 per 1,000 sheets.
No. 305, Barton, Duer & Koch Paper Company, $28.70 per 1,000 sheets.
No. 306, Old Dominion Paper Company, 4.397 cents.
No. 307, Old Dominion Paper Company, 4.397 cents.
No. 308, Old Dominion Paper Company, 4.397 cents.
No. 309, Old Dominion Paper Company, 4.397 cents.
No. 310, Old Dominion Paper Company, 4.397 cents.
No. 325, R. P. Andrews Paper Company, (2,400,000 pounds) at 5.37 cents; Barton, Duer & Koch Paper Company, (3,000,000 pounds) at 4.94 cents; and Paper Corporation of U. S., (600,000 pounds) at 5.311 cents.
No. 351, Barton, Duer & Koch Paper Company, $6.53 per 100 sheets.
No. 352, Andrews Paper House of York, Pa., $17.40 per 100 sheets.
No. 360, Barton, Duer & Koch Paper Company, 1.35 cents.

for

Board Machines
Tissue Machines
Deckers
Pulp Thickeners
Pulp Washers
Wet Machines
Presser or
Lump Breaker Rolls

TENSILGRIP

Soft COUCH ROLL

Can be furnished with internal or external bearings

Conforms better to any unevenness of Cylinder Mould.
Has a wide nip area.
Gives better Couching action.
Preserves wire facings.
Will not crush.
Uniform density insures uniform squeeze.
Withstands more abrasion.
Requires less frequent grinding.
Lives longer.
Increases machine speeds.

Tensilgrip isn't just a "no hard rubber base" Couch roll. It's an extremely soft Couch roll, down to the metal core. This soft rubber is carried down over the ends of Tensilgrip Couch Rolls as a seal against moisture and corrosion.

AMERICAN WRINGER COMPANY, Inc.

Rubber Roll Specialists for nearly 50 Years

FACTORIES

WOONSOCKET, R. I. FARNHAM, QUEBEC

New York Office, 267 Fifth Ave. Chicago Office, 105 West Madison St.

Pacific Coast Representative: Walter S. Hodges, Pacific Bldg., Portland, Ore.

AGENCIES

The Williams-Gray Co., 221 No. LaSalle St., Chicago, Ill. E. N. Bechard, 60 E. 16th St., N. E., Atlanta, Ga.

T-94

No. 361, Enterprise Paper Company, 1.2925 cents.
No. 362, Mathers-Lamm Paper Company, 4.744 cents.
No. 363, No bid.
No. 364, Barton, Duer & Koch Paper Company, 1.70 cents.
No. 365, Barton, Duer & Koch Paper Company, 1.69 cents.
No. 366, Mathers-Lamm Paper Company, 3.385 cents.
No. 367, Mathers-Lamm Paper Company, 3.385 cents.
No. 368, R. P. Andrews Paper Company, 5.00 cents.

Sorg Paper Co. Elects Director

At a special meeting of the board of directors of the Sorg Paper Company held at the principal offices of the company in Middletown, Ohio, on April 8, 1938, certain changes were made effective in the executive management and personnel of the company; in addition the directors also took action upon the vacancy existing in the board due to the death of L. C. Anderson who died in February of this year.

Officers of the company re-elected by the board of Directors in the annual meeting held in February, 1938, and continuing in their present offices are: J. A. Aull, president; M. T. Hartley and A. F. Smith, vice-presidents; C. E. Aull, assistant secretary, and A. J. Kerschbaum, assistant treasurer.

Donald G. Driscoll was elected to the newly created office of executive vice-president, relinquishing his former duties as secretary and assistant to the president.

H. C. Johnson, formerly treasurer, was elected to the office of vice-president in charge of sales.

John A. Aull, Jr., was elected secretary and treasurer.

C. B. Stiles was elected assistant to the president and was also elected to fill the vacancy in the board of directors.

L. H. Ritz was elected to the newly created office of controller of the company.

The personnel of the company was re-organized by the following appointments: A. D. Sherman, director of purchases; R. B. Roe, technical director; A. J. Kerschbaum, manager of cost accounting and statistics; Claude A. Sorg, manager of Sorg Division; L. C. Currier, manager of Oglesby and Smith Divisions.

In the sales department, C. J. Nicol was appointed first assistant sales manager, and D. D. Thirkield, second assistant sales manager.

F. M. Stephens, with offices in the Daily News Building, Chicago, and R. T. Olsen, with offices in the Chanin Building, New York City, will continue in charge of sales in the western and eastern territories respectively.

E. E. Brown is to continue as general manager of the Bag Division of the company in the same official capacity as heretofore.

Irving Worthman, with offices in the Chanin Building, New York City, will be in charge of sales of the facial tissue division of the Company.

R. Z. Moore has been employed by the Company as director of industrial relations.

Superintendents Meet at Kalamazoo

KALAMAZOO, Mich., May 23, 1938 — The last meeting of the season of the Michigan Division of the American Pulp and Paper Mill Superintendents' Association was held at the Park American Hotel, Thursday evening, May 19, at 7 o'clock, with thirty present. Chairman Dan Stacy was unable to be present and Ray L. Barton presided. Secretary Al Perlick read his report which showed the Division to be in excellent condition. A nominating committee consisting of Homer Stafford, Otto Fischer and Art Cole was appointed by the chair. Ernest W. Neir and Rodney Schroops of the Pantlind Hotel in Grand Rapids were present and invited the association back to Grand Rapids for the National Convention in 1940.

The speaker was Joe Baxter of the Shartle Brothers Machine Company; his topics being "Stock Preparation." Using a blackboard to illustrate his talk, he gave an instructive address, answering a barrage of questions in the meantime, and demonstrated to the satisfaction of those present that he was an authority on his subject. The next meeting will be held September 15.

Those attending the meeting were H. E. Stafford and Carl C. Schneider, Hawthorne Paper Company; A. E. Hays, M. S. Fogerty, R. L. Barton and W. H. Astle, Michigan Paper Company; H. S. Johnstone, Lee Paper Company; G. C. Schmid, Michigan Paper Company; E. G. Walker, J. F. Carrigan, M. F. Flotou and F. L. Zellers, French Paper Company; Joe Baxter, Shartle Brothers Machine Company; A. B. Perlick, R. B. Stewart and L. H. LaLiberte, Kalamazoo Vegetable Parchment Company; B. A. Yule and V. Greely, F. C. Huyck & Sons; Arthur Cole, Rex Paper Company; L. H. Larson, Vanderbilt Company; W. B. Hadley, Detroit Paper Products Corporation; Glen Sutton and Arnold Weller, Sutherland Paper Company; W. F. Wolfe, Mac Sim Bar Paper Company; Paul R. Schrieber, General Dyestuff Corporation; O. F. Fischer, Bryant Paper Company; William Wessel, Willard Barnhart, AMC Box Board Company; R. Schroops and E. W. Neir, Pantlind Hotel; H. E. Stratton, PAPER TRADE JOURNAL.

N. E. Paper Merchants Hold Outing

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., May 23, 1938—The New England Paper Merchants Association held a very successful outing last Monday at the Rhode Island Country Club, Barrington, R. I., with approximately 60 present. There were luncheon and dinner and golf.

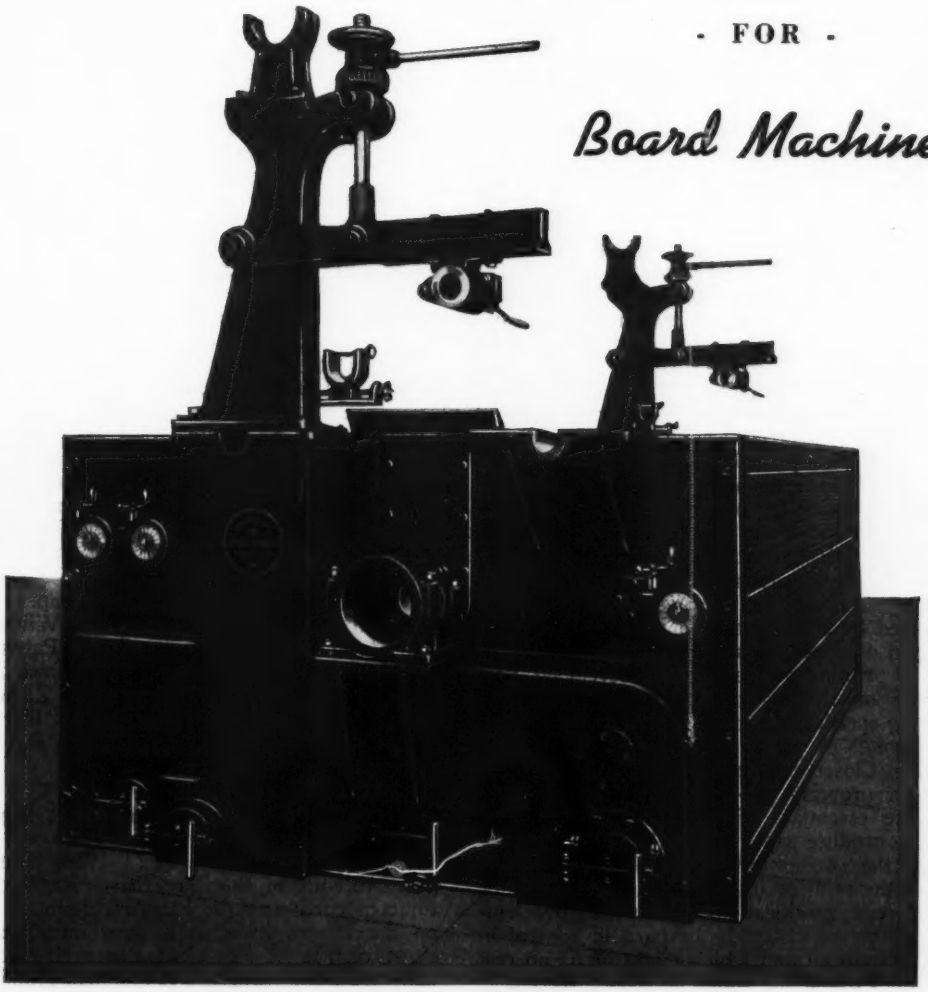
The following were winners, to whom handsome prizes were awarded:

Low gross, Harold B. Simmons, Industrial Paper and Cordage Company, Pawtucket, R. I., a folding poker table; second low gross, W. N. Stetson, Jr., Storrs & Bement Company, leather suitcase; first low net, Herbert C. Fowler, International Paper Company, pigskin travel set; second low net, E. Lindsey Cummings, Storrs & Bement Company, zipper bag; first kickers' handicap, Frank B. Cummings, treasurer of the association, gold glass liquor set; second kickers' handicap, W. Edwin Poret, Jr., Cook-Vivian Company, electric fan; third kickers' handicap, Lawrence Southwick, Plymouth Cordage Company, pen and pencil set; consolation prize, E. W. MacDonald, Industrial Paper and Cordage Company, smoking stand.

THE *New* CONTROL-FLOW CYLINDER VAT

- FOR -

Board Machines



A REAL ADVANCE IN CYLINDER VAT DESIGN

PERMITS WIDE RANGE OF WEIGHTS
with
MAXIMUM CONTROL OF FORMATION

THE BAGLEY AND SEWALL COMPANY - Watertown, New York

TAPPI Discusses Paper Testing and Printing Quality

The New England Section of the Technical Association of the Pulp and Paper Industry met at the Roger Smith Hotel in Holyoke, Mass., Friday evening, May 20, for dinner, after which R. H. Doughty, recently elected Vice Chairman, presided in the absence of the Chairman.

The guest speaker was B. L. Wehmhoff of the West Virginia Pulp and Paper Company.

In his talk Mr. Wehmhoff outlined the development of the present standard paper tests which have taken years to develop and showed that these tests, although satisfactory from a paper manufacturer's viewpoint of these tests, are of little value to the consumer or printer regarding the suitability or uniformity of the paper for printing.

The printing industry, as a whole, has been somewhat lax in the development of specific tests, nevertheless the Lithographic Foundation, Government Agencies and a few individual printing plants have developed the few tests in use today. The tests commonly used to determine printing quality are printing smoothness, surface strength, opacity, ink receptivity and, in some cases, density or porosity.

Sizing tests in themselves are no definite indication of ink receptivity or printability. Paper sized satisfactorily for writing purposes is no safe indication that it will be suitable for printing inks as these inks have an oil base. There is no such thing as "a good printing paper". Each printing process has its own definite paper requirements. The above mentioned tests are very necessary but their true value can only be determined by a study of the particular printing process, kind of press, press speed, etc.

With new printing processes being developed, new inks coming on the market at frequent intervals, presses being speeded up, it is evident that the printing requirements of paper are becoming more rigid and varied. Closer control of printing quality of paper within properly pre-determined limits is becoming more essential. The paper industry must learn how to produce paper within the limits required by each of the various printing processes. Unless this is done the printing industry will sooner or later develop its own specifications which will over-emphasize qualities which might be hard to control in paper manufacturing and which might be of no real significance. From a standpoint of self-protection, if for no other reason, the paper industry should pay more attention, in the future than it has in the past, to the problem of furnishing the printer with uniform paper from a printing point of view.

An interesting discussion followed Mr. Wehmoff's talk.

An enlightening film was shown through the courtesy of the Sandy Hill Iron & Brass Works, Inc.

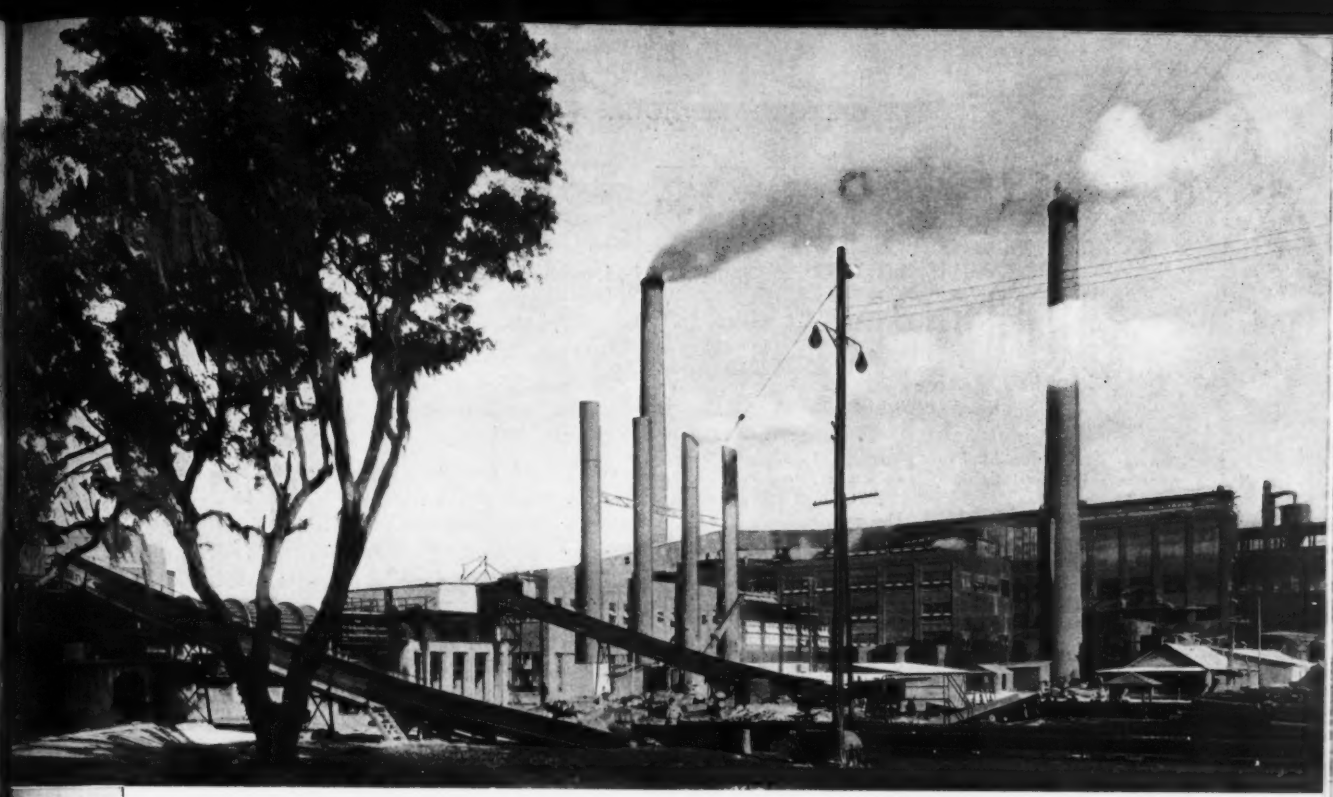
Those in Attendance

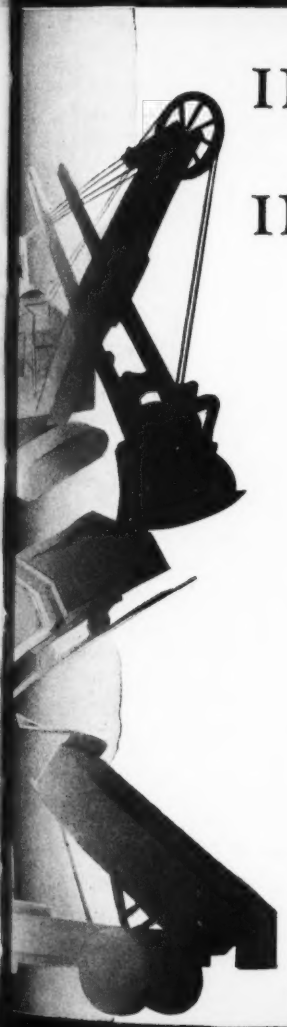
Among those present were: H. W. Schwartz, O. W. Messner, Harry J. Bell, of the Robertson Paper Box Company; Murray M. Rubin, of the Fraser Paper Ltd.; Cornelius Stapley, Chemical Paper Company; W. F. Drake, F. L. Loveday, J. E. McNally, of the Dennison Manufacturing Company; William Glendon, L. E. Richards, Crane & Co.; William Talbot, C. A. Cote, Dennison Manufacturing Company; Robert Mannheim, Mathieson Alkali Works; D. K. Bartlett, Jr., West Dudley Paper Company; G. E. Holman, Brooks Bank Note Company; W. L. Egy, W. & L. E. Gurley; Arthur M. Brooks, Raffold Process; L. N. Smith, M. C. Smith, American Tissue Mills; T. H. Cook, Hercules Powder Company; W. O. Johnson, Westfield, Mass.; J. W. Joslyn, Sandy Hill Iron & Brass Works; C. G. Landes, American Cyanamid and Chemical Corporation; Dr. A. R. Lukens, Thompson-Weinman Co., Inc.; W. P. Richardson, Arthur D. Little, Inc.; Helen Parlee, Thompson-Weinman Company; S. W. Blanchard, Wheelwright Company; R. H. Decker, Jr., Mead Sales Company; A. C. Lamoureaux, Albert Bray, Dennison Manufacturing Company; Helen U. Kiely, Lena E. Kelley, John Ramsbottom, Donald Young, John T. Leecock, Leonard Taylor, M. V. Horgan, Andrew Jackson, Thomas Flaherty, American Writing Paper Corporation; R. J. Proctor, A. M. Altieri, C. W. Damon, R. H. Doughty, Fitchburg Paper Company; E. E. White, John Honkard, Frank R. Filz, Wheelwright Company; S. A. Brown, Edward Sweeney, Anthony J. Urbanetti, Dixon E. Burdick, Rogers Paper Manufacturing Company; E. O. Reed, Crane & Company; W. J. Burke, General Dyestuff Corporation; B. L. Wehmhoff, West Virginia Pulp and Paper Company; William Whiting, Jr., Charles Davidson, C. L. Reece, Whiting Paper Company; R. D. McCarron, Stein-Hall & Co.; William Anderson, Stevens Paper Company; R. W. Pattison, American Writing Paper Corporation; James Fitzgerald, Collins Manufacturing Company; H. Z. Schniewind, Testing Machines, Inc.; W. N. Welch, Hart Moisture Gauge Company; A. L. Perry, Krebs Pigment Company.

Plans for Panther Mountain Reservoir

[FROM OUR REGULAR CORRESPONDENT]

WATERTOWN, N. Y., May 23, 1938—The plan proposed recently by the Black River Regulating Board for construction of the Panther Mountain Reservoir on the Moose River is a possibility, according to latest reports, if President Roosevelt's four billion dollar spending program is adopted. Application for the $4,000,000 required for the reservoir was approved by the P.W.A. some time ago and construction can start immediately when the financing is provided, it was stated. It is claimed that the project would be of great benefit to paper mills and other industries in Northern New York with its 12,000,000 cubic feet of water storage. Mills that have been hampered in recent years by low water at certain times would also find a remedy for their difficulties while dangers from floods would also be lessened. Plans call for clearing 4,124 acres of land and construction of a dam 1,800 feet long, consisting of 1,600,000 cubic yards of enbankment. The reservoir would have a depth of 160 feet and an average depth of 67 feet.





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A three-unit kraft pulp and paper mill with daily capacity of 600 tons of paper and 100 tons excess pulp, built for Union Bag and Paper Corporation at Savannah, Ga. Record construction (both for time and cost per ton of capacity) of first unit brought contracts for other two units.

ENGINEERING CONSTRUCTION DIVISION

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COMING EVENTS IN THE PAPER INDUSTRY

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. Fall meeting, Northland Hotel, Green Bay, Wis., September 8-10.

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Nonotuck Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—Second Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATE SECTION, Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION, Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

AMERICAN PULP AND PAPER MILLS SUPERINTENDENTS ASSOCIATION. Annual meeting, Royal York Hotel, Toronto, Ont., June 22-24.

OBSTACLES TO RECOVERY

The major obstacles now blocking the road to industrial recovery are three ill-conceived pieces of legislation—the Government Spending Plan, the Wagner Labor Bill, S.3390, and the Wages and Hours Bill. All three are examples of that fallacious reasoning which forms a large part of the New Deal philosophy, such as spending to attain prosperity, curtailment of crops to obtain higher prices through scarcity, and minimum wages and maximum hours to raise the national income of wage earners.

As to the wisdom of more government spending it might be well to first look at the record of the achievements of the Roosevelt Administration which possesses undisputed talent for keeping the nation deeply in the red. It is unfortunate that the Administration has not kept in mind the economy message of President Roosevelt of March 10, 1933 which said in part: "For three long years the Federal Government has been on the road to bankruptcy. . . . Too often in recent history liberal governments have been wrecked on rocks of loose fiscal policy. We must avoid that danger . . . . If this is done, there is a reasonable prospect that within a year the income of the Government will be sufficient to cover the expenditures of the Government."

According to Treasury Department statistics made public on May 17, the Roosevelt Administration has spent more than $20,312,000,000 for recovery, relief and other New Deal projects since 1933. This spending is almost entirely responsible for the increase in the national debt from $20,937,350,964 when President Hoover left office in March 1933, to $37,459,475,365 on May 13. The recent statement of acting Budget Director Daniel W. Bell that the deficit in the next fiscal year might be approximately $3,700,000,000 indicated a national debt in excess of $40,000,000,000 on June 3, 1939, about twice the national debt at the end of the Hoover Administration.

In addition, the Federal Government has guaranteed about $4,700,000,000 of obligations issued by various Federal lending agencies, such as the Reconstruction Finance Corporation, Federal Farm Mortgage Corporation and Home Owners' Loan Corporation. These obligations are not part of the national debt though the Federal Government is responsible for interest and principal if any of these agencies should default. The expenditures from March 4, 1933 to April 30, 1938, which are largely responsible for the increased public debt, are as follows: Work relief $7,040,000,000; Direct relief $3,163,000,000; Agricultural Adjustment program $2,314,000,000; Veterans' bonus $2,230,000,000; Agricultural aid (recovery relief) $1,227,000,000; Civilian conservation corps $1,851,000,000; Highways $1,389,000,000; National defense (recovery relief) $497,000,000; Reconstruction Finance Corporation $278,000,000; Home Owners' Loan Corporation $200,000,000; and Low Cost Housing and Slum Clearance $123,000,000.

In view of the mounting burden of taxes required to support the excessively high cost of government under the Roosevelt Administration it appears that the time has now come to curtail and not to increase expenditures. During the last five years the Roosevelt Administration has spend a larger sum of money than was spent by all the Administrations from that of George Washington down to that of Woodrow Wilson. Yet still more spending is proposed. It is this reckless spending policy of the Roosevelt Administration which has created doubt and fear as to the future and stopped the normal flow of private funds into productive channels. Priming the pump is after all a desperate expedient calculated to get the country out of the "hole" into which unsound economic and monetary policies have forced the country, yet the same policies will be continued.

The Wagner Labor Bill, S.3390, which would extend the authority of the National Labor Board to include all persons who sell or borrow from the Federal Government would, in the opinion expressed by the Chamber of Commerce of the United States, have a harmful and widespread effect on all industry and trade. It would centralize control of all employment relations in the Federal Government. As John W. O'Leary, chairman of the Chamber pointed out, "It

will subject to double penalties employers already subject to the National Labor Relations Act, through the forfeitures contemplated by the bill in addition to the penalties, often severe, provided by the Act, such as back pay in large amounts.

The Wages and Hours Bill is not only objectionable to industry and trade for the harmful effect it would cause but the measure is wrong in principle. It is another attempt of the Roosevelt Administration to increase centralized control in Washington by legislation that properly belongs to the States. Many states now have minimum wage laws. For example, New York State has a minimum wage for women and minors in some occupations. Recently a minimum weekly wage of $16.50 with a maximum work week of forty-five hours was tentatively established. A few months ago a minimum weekly wage of $14 for a forty-hour week was fixed in laundries in New York City and in Westchester and Nassau Counties. Outside this zone, a weekly wage of $12.80 with a hourly rate of 32 cents was established in cities of more than 18,000 population. In smaller cities and towns an hourly minimum of 30 cents was established.

The wages and hours question is clearly a problem for legislation and administration by the States, with equitable rates of wages and hours determined after careful study. There can be little doubt that the House Wages and Hours Bill, which was hastily drawn without any attempt to ascertain the probable effect upon workers and industries in different parts of the country, would fail to either increase the wages of the workers affected or insure them employment.

Bayless Plant at Austin Closed

"The plant of the Bayless Pulp and Paper Corporation, located at Austin, Pa., has been closed," according to the *Sun* of Williamsport, Pa. Reasons for closing were not disclosed.

"This plant has been experiencing a steady downfall since a catastrophe on September 30, 1911, when a hugh dam located below the mill broke, taking around eighty lives and nearly wiping out the business and residential section of what was the third largest town in Potter county, with a population of 2,941.

"A smaller dam was then built but nearly half the residents left the section. It is feared that the present shutdown may be permanent."

New Groveton Paper on Market Soon

[FROM OUR REGULAR CORRESPONDENT]

GROVETON, N. H., May 23, 1938—The new tub-sized paper, Sulphite No. 4, made by the Groveton Paper Company, Inc., will be on the market very soon. The equipment for making this paper is the most modern known. Work has been under way for several months, with recent trials very satisfactory.

Guy Cushing, a man of long, practical experience in the paper industry, has recently become connected with the concern in the capacity of superintendent.

Production Ratio Report

These statistics are based upon paper production reports to the American Paper and Pulp Association.

COMPARATIVE MONTHLY SUMMARIES

Months	1938(c)	1937(c)	1936	1935	1934
January	63.9%	90.3%	76.1%	65.8%	.....
February	68.7%	90.1%	77.9%	70.0%	.....
March	69.6%	90.3%	76.0%	70.5%	.....
April	67.8%	92.1%	82.3%	70.0%	.....
May	.....	90.6%	81.6%	69.4%	.....
June	.....	87.3%	80.7%	72.3%	.....
July	.....	81.8%	77.3%	64.9%	.....
August	.....	82.9%	81.5%	70.9%	.....
September	.....	78.6%	80.5%	71.9%	58.2%
October	.....	73.5%	87.6%	75.6%	64.7%
November	.....	61.9%	88.0%	75.3%	61.7%
December	.....	54.5%	85.9%	71.2%	59.6%
Year Average	.....	80.6%	81.3%	70.5%	.....
First 19 weeks	67.5%	90.6%	78.6%	68.9%	.....

COMPARATIVE WEEKLY SUMMARIES

CURRENT WEEKS, 1938		CORRESPONDING WEEKS, 1937	
*April 9	67.3%	April 10	92.4%
*April 16	67.3%	April 17	93.3%
*April 23	66.7%	April 24	90.9%
*April 30	69.9%	May 1	91.6%
*May 7	66.4%	May 8	89.5%
*May 14	66.9%	May 15	90.9%

The following statistics show the number of mills reporting by ratio groups:

	Number of Mills Reporting, Current Weeks					
Ratio Limits	Apr. 9, 1938	Apr. 16, 1938	Apr. 23, 1938	Apr. 30, 1938	May 7, 1938	May 14, 1938
0% to 50%	105	94	111	98	98	65
51% to 100%	206	214	194	204	194	149
Total Mills Reporting	311	308	305	302	292	214

* Subject to revision until all reports are received.
(c) Basic capacity data have been adjusted to correspond with ratings reported by individual companies.

PAPERBOARD OPERATING RATIOS

According to reports from the National Paperboard Association, per cents of operation, based on "Inch-Hours", were as follows:

Mos.	1938 (e)	1937 (e)	1936	1935	Mos.	1938 (e)	1937 (e)	1936	1935
Jan.	55%	80%	61%	61%	July	.....	67%	69%	59%
Feb.	61%	86%	67%	67%	Aug.	.....	74%	75%	65%
Mar.	60%	87%	68%	67%	Sept.	.....	70%	76%	69%
Apr.	.....	89%	70%	61%	Oct.	.....	66%	82%	76%
May	.....	86%	68%	61%	Nov.	.....	56%	79%	70%
June	.....	75%	68%	65%	Dec.	.....	46%	74%	60%

Week end. Apr. 9, 1938—58%
Week end. Apr. 16, 1938—58%
Week end. Apr. 23, 1938—54%
Week end. Apr. 30, 1938—59%
Week end. May 7, 1938—57%
Week end. May 14, 1938—56%

(e) Basic figures revised to include new members of the National Paperboard Assn.

Group Chairmen for Toronto Meeting

G. W. Craigie, convention manager, announces the following list of group chairmen for the nineteenth annual convention of the American Pulp and Paper Mill Superintendents Association, to be held at the Royal York Hotel, Toronto, Canada, June 22-24 inclusive:

Chemical Pulp — John McCrystle, Brown Corporation, La Tuque, Que.

Power Engineers — K. E. Terry, S. D. Warren Company, Cumberland Mills, Me.

Tissue — J. E. Blosser, Veldown Company, Glens Falls, N. Y.

Fine Papers — R. W. Hynes, Newton Falls Paper Company, Newton Falls, N. Y.

Board — R. M. Cook, Hinde & Dauch Paper Company of Canada, Ltd., Toronto, Ont.

Finishing, Storing and Shipping — Donald R. Dick, Howard Smith Paper Mills, Cornwall, Ont.

Coarse Papers — H. D. Hyman, J. R. Booth, Ltd., Ottawa, Ont.

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Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

Refining of Pulp in the Light of Patent Literature*

By Georg Jayme[1]

The refining of pulp obtained by some kind of pulping process and still containing incrusting substance, has long been the goal of technical research, and these results have been made public in numerous patents. The literature concerned has, especially in the last decade, taken on such a volume that it seems appropriate to subject the proposed processes to a review. When doing so, one cannot help stating that quite often, the method of operation, proposed by different inventors, are astonishingly similar. The objective observer must, therefore, ask himself how it was in many cases at all possible for them, to obtain fresh patent rights on certain processes apparently completely lacking novelty. Perhaps the explanation for this is to be sought in the fact that in many countries the patent offices have not taken a clear position beforehand in regard to the already known procedures and then, later on, were not able any longer to dam the flood. This is certainly so in the U.S.A., and I was once assured, from a well informed party, that even the patent office of the United States does not possess sufficient means for employing enough examiners and officials to ever be able to clear up the highly involved patent situation as regards refining of pulp by way of alkaline treatments.

If we now try to give a report, we must limit ourselves in each case to one of the most characteristic patents without regard to priority. We also do not wish to give a verbatim description of the patents and refer in this respect to the excellent reference book of O. Faust, which reviews very exhaustively most of the patents up to the middle of the year 1933, and also to the patent abstracts of the technical journals.

By refining in the meaning of this paper, we wish it exclusively to be understood as the raising of the alpha cellulose content, excluding the methods of pure lignin and pitch removal. The increase of alpha cellulose content is attained through a more or less extensive removal of the easily soluble hemicellulose, mannan, pentosans, polyuronides, etc., whereby, as the most important means, alkali alone or in some kind of combination with another substance is used.

The refining processes may be divided easily into groups according to the prevailing temperature during the refining; thus, into "hot" and "cold", into combined "hot-cold" and "cold-hot" processes, moreover, according to the nature of the successive operations, into "alkaline-acid" and "acid-alkaline" procedures. As a special group, there is still to be mentioned the "mild" alkaline treatment, which aims at bestowing certain mechanical-physical properties on the fibers.

The Alkaline Hot Refining Processes

At first we turn to the *hot* processes in which the suitable pretreatment of the stock to be refined plays an important part. Here should be mentioned immediately as the most important fact the pre-bleaching of the unbleached pulp. As I have explained in another article *(1)*, the hot refining process can be most expediently inserted as an intermediate stage in a multi-step bleaching process, in which elementary chlorine is most advantageously employed during the first stage. The lignin chlorides still present in the pulp after washing with water will then be removed during the refining, together with the hemicellulose, and the resultant refined pulp can then be afterbleached with slight expenditure of oxidizing agent.

Apparently, bleached pulp does not possess enough resistance to the hot refining treatment, and even for a prebleached pulp, a certain minimum viscosity is indispensable.

The process by which the pulp is pretreated with cold alkali, i.e., mercerized before the hot refining, will be discussed in another place.

Also pretreatment with acid has been recommended, for example, by Schwalbe *(2)*, who wished to facilitate the refining procedure with the aid of a nitric acid pretreatment and attained a pentosan free, refined pulp, similar to cotton. This process has a certain similarity to the Philanizing process used for cotton. Similarly, nitric acid, is used also by the I. G. Farbenindustrie *(3)* for the purpose of making wood with a high resin content, i.e., pine, accessible to refining.

Further, pretreatment with sulphite liquor at a high temperature is recommended *(4)*.

Among the procedures of mechanical pretreatment, there should be mentioned the explosion-process of

* This paper was given in Berlin at the General Meeting of the Pulp and Paper Chemists and Engineers, Dec. 11, 1936.

[1] Member TAPPI, Professor, Institute of Cellulose Chemistry Technical College, Darmstadt, Germany.

Authorized translation from the original publication in "Papier-Fabrikant vereinigt mit Cellulosechemie" 35: 2-8; (1937) by E. and T. W. Toovey.

Dreyfus *(5)* by which the pulp, together with a gas generating liquid, is brought to a high temperature and pressure, and the mass is then suddenly released; a procedure that displays a dependence on the well known Masonite process. Here also may be mentioned the removal of short fibers, respectively the separation of short and long fibers, a procedure, which Brown Company first proposed, intending to adapt the process to the fineness of material, and thus to recover from each material the maximum yield.

Regarding the uniting of chemicals and pulp there exists, apart from the usual mixing before or during the reaction, a whole series of proposals which do without mechanical mixing, and which really belong to the realm of cold-hot refining. That is to say, the pulp is impregnated with a liquor in the cold and then the excess is removed by pressing or centrifuging, whereupon the mass is diluted and subjected to a cooking process. The amount of alkali left in the pulp accomplishes the refining.

In this class belong the patents of Opfermann and his co-workers *(6)*, Basset *(7)*, and the I. G. Farbenindustrie *(8)*; the latter recommends this procedure especially for the hot refining of beech pulp. One can well understand that in this way a rather ideal distribution of alkali through the reaction mass will be obtained.

Concerning the amount of alkali itself, this will depend on the degree of refining. It is as well to indicate in the hot refining, both the concentration of the liquor present, as well as the amount of sodium hydroxide calculated on the fiber treated. One would not go wrong if one assumed as the highest practical limit for hot refining, 10 per cent sodium hydroxide, or its equivalent in alkali, calculated on the fiber weight. This quantity would correspond to a concentration of about 0.5 to 1 per cent with a stock consistency of 5 to 10 per cent. Also, under certain circumstances, the peculiarity of the pulp to be refined and other local conditions may necessitate the raising of the alkali quantity above 10 per cent on the fiber weight. Naturally, proposals are not lacking suggesting the use of essentially more or less sodium hydroxide in order to attain certain purposes. So, in a Canadian patent *(9)*, the utilization of a dilute liquor of a concentration of from 0.1 to 0.2 per cent at a high temperature is described, but there, with the purpose of securing a reduced viscosity.

It lies in the nature of the case that many patents deal with the advantages of certain admixtures to the sodium hydroxide during the refining treatment. In the first place, solium sulphite must be mentioned. This, according to the well known Waldhof patent *(10)*, is employed in a concentration up to 0.8 per cent during the refining. A lighter product is obtained and the derivatives made from the refined pulp give colorless solutions. This effect is due to the sodium sulphite acting as a reducing agent and thus counteracting the deleterious influence of the ever present oxygen of the air.

By the additional use of sodium carbonate and alkaline earths, one aims, besides economy, at a protective treatment of the pulp. Likewise, the favorable influence of dispersion agents, which act as a source for alkali, such as borax, sodium phosphate *(11)*, water glass and the like, depends for the greatest part on this, their buffering effect.

The Pallazzos *(12)* and Brown Company *(13)* have recommended the addition of a soap solution, a means, adapted from the preparation of cotton linters. Since the soap solution, in order to be more efficient, must be employed apparently in a concentration up to 0.3 per cent, this represents, because of the relatively very high price of soap, a further rise in cost of a, itself quite expensive, refining process. It may, however, be taken for granted, that soaps or similar substances act very favorably in their property as wetting or resin removing agents, and if used correctly, give a brighter, more uniform stock.

In the same category as the use of glycerine *(14)* also belongs the addition of waste liquor from the refining process *(15)* for the purpose of further increasing the amount of organic substances, dissolved, in order that in the end, the concentrating and burning of the liquor will be economically feasible.

The proposal to add an oxidation agent during hot refining process is scarcely to be taken in earnest.

Summarizing then, one can attribute to wetting agents, as well as dispersing and reducing substances a certain importance as auxiliary agents in the alkaline hot refining procedure.

The range of the agents which may be employed in the place of caustic soda solution is very wide. Here should be mentioned first Opfermann's patent *(16)* of the year 1909 which rests mainly on the use of alkali carbonates to which can be added caustic alkali or alkali sulphides in small amounts. In the use of sodium carbonate, Opfermann sees an agent for the protective treatment of pulp. Ten years later, Schwalbe *(17)* received a refining patent dealing with the use of alkaline earths, the solubility of which he sought to increase through the addition of calcium lactate, later also of common salt.

Seaman *(18)* proposed the use of ammonia in mixtures of ammonium salts, such as ammonium sulphite or sulphide for the purpose of attaining better yields, higher alpho cellulose and a higher degree of whiteness. It is still too early to give a final decision on these proposals.

The reaction conditions in the hot refining process denoted by temperature, pressure and time, claim a special interest. The amount of alkali used must be adjusted to the desired degree of refining. For a relatively low alpha cellulose content, i.e., not higher than 94 per cent, the most convenient working temperature is below 100 deg. C.

As to the processing conditions one may perhaps rely upon the very broad limits given in an American patent of the Brown Company *(19)*, wherein, to attain an alpha cellulose content of 94 per cent, the following conditions are proposed: 9 to 12 per cent pulp consistency; 5 to 8 per cent sodium hydroxide, calculated on fiber weight; 3 to 8 hours at 82 to 100 deg. C. In order to obtain a still higher alpha cellulose content more severe processing must be chosen. So, for example, the Pallazzos *(20)* recently proposed the use of a 5 to 1.5 per cent caustic solution containing sulphite, which means that at a 10 per cent pulp consistency, about 9 per cent sodium hydroxide is used, calculated on the weight of pulp. In order to produce a pulp similar to cotton with an alpho cellulose content of 96 to 99 per cent the mixture is heated from 1 to 3 hours at a pressure of 1 to 2 atmospheres.

The method of washing after the alkali treatment has perhaps not been given enough attention. One must conduct the refining stages in such a way that

at the end of the reaction a certain amount of free alkali is still present, so that during the washing, the stock remains slightly alkaline. Moreover, it has been proved that washing with hot water gives a somewhat higher alpha cellulose content and a brighter product. At the same time, however, probably the slighter advantage obtained in this way stands in no relation to the cost.

In general, everyone seems to relinquish the idea of the recovery of the sodium base. The solutions are so dilute that if there is no wish to concentrate the cooking liquor as mentioned above, it is better to allow the resulting dark brown liquid to go to waste.

Here the question should be raised, how high can the alpha content actually be increased through the hot refining process?

Experience teaches that each pulp to be refined possesses a certain optimum refining degree attainable, the upper limit of which is determined by the superimposition of the two reactions, namely: the raising of the alpha cellulose content by dissolving out of hemicelluloses, and the lowering of the alpha content by the degrading reaction of hot alkali on cellulose in the presence of oxygen.

Except for one very exceptionally optimistic patent (see the Pallazzo patent mentioned above) apparently the highest alpha cellulose obtainable by the hot refining process is in the neighborhood of 96 per cent.

It is entirely dependent on the character of the pulp in question whether or not this border of 96 per cent can be exceeded and this only by retarding the second reaction.

It should be advisable to run a series of trial cooks for each proposed pulp to determine the point at which the relatively highest alpha cellulose content is reached, with the relatively highest yield. Then in actual operation it will not be difficult to check the optimum conditions found by the trial cooks and fix them exactly.

The losses of substance which occur during refining are large. If the alpha cellulose content is to be raised from 87 to 96 per cent, theoretically the loss should amount to only 9.4 per cent, i.e., the yield to 90.6 per cent and yet one has to calculate with an actual loss of 25 to 30 per cent, i.e., a yield of only 75 to 70 per cent.

Therefore, one may safely assume that in free competition that procedure rendering the largest yield of refined cellulose will have the best prospect of success. At the same time, naturally, one must pay attention to the properties of the pulp to be refined, and as seen from the foregoing statements, one would do well to exclude the oxygen of the air as far as possible.

At the close of these notes on hot refining, the afterbleaching of the refined pulp remains to be mentioned. Evidently, through the hot treatment, the pulp becomes rather sensitive and tends to lose, during the bleaching the alpha cellulose substance obtained at such great expense. Therefore, it is understandable that for the bleaching of alpha pulp, a bleach liquor, strongly buffered with caustic, should be employed.

The Deutsche Gold, und Silberscheideanstalt, for example, *(21)* proposes as a bleaching agent for refined pulp, sodium peroxide in the presence of a large excess of caustic soda and water glass and even wants to have all oxygen from the air excluded during the course of bleaching in order to hold the alpha cellulose content of the bleached pulp at a height of 95.9 per cent. In this respect, therefore, the processes for afterbleaching which deal with the use of permanganate in a sulphuric acid solution *(22)* do not appear well founded, unless it is the aim of this method to produce pulps of special properties which perhaps concern the viscosity of the cellulose, or they may be looked upon as afterbleaching processes, requiring such small amounts of reagents that the term "oxydative acidifying" should be more appropriate.

Cold Refining Processes

Although as raw material for the "cold refining process" unbleached, prebleached and full bleached pulps should come into the question, it is very probable to assume that only completely or partially bleached pulps are really suitable.

Ever since the year 1900 *(23)*, bleached or prebleached pulp was used for cold refining. Irrespective of the many similar proposals made in the meantime, one may be singled out from the newer procedures. Uddeholm *(24)* recommended in the year 1933 a treatment first with hypochlorite and then with chlorine to prepare the pulp for refining. The underlying motives are to be sought in a similar direction as discussed above for hot refining. The point is that the material refined in the cold should be subjected to as mild an after-bleaching as possible, perhaps even to avoid this stage entirely, and to replace it by a mere color brightening acidification, all this again with the final aim in view of keeping the alpha cellulose content if at all possible up to the height already reached.

In contrast to the hot refining process, the cold refining procedure is carried out with a highly concentrated caustic liquor. From a purely chemical point of view a liquor should be employed, which possesses the maximum swelling power for the pulp in question and under the condition applied. Since a maximum swelling effect can at lower temperatures be obtained by liquors of a lower concentration, the general reaction conditions are determined by this relationship between concentration of caustic soda and temperature of the liquor. This is expressed most clearly in the Waldhof patent of Faust and Hottenroth *(25)* where, at 20 deg. C., a liquor concentration of 12 per cent is recommended; at 0 deg. C., from 8 to 9 per cent; and at minus 10 deg. C., from 6 to 8 per cent. All other proposals of this kind move along similar lines and contribute nothing essentially new.

A study of the processes which are based upon the use of liquors containing other reagents besides caustic soda proves very interesting. In a Finnish patent of 1936, av Schulten *(26)* proposes the application of white liquor from the sulphate process and adds to it alkali—sulphite or hydrosulphite, moreover alkali sulphide and traces of metals such as iron, nickel and manganese. The reducing agents are supposed to prevent oxidation by air, the metals to increase catalytically the dissolving out of hemicelluloses. The attractive side of this proposal consists of the fact that white liquor from the sulphate process may be used. This points to the obvious possibility of connecting the cold refining and sulphate processes, perhaps in a symbiotic way, a possibility which later will be discussed again when dealing with the recovery question and which before had already been recognized by the Brown Company. *(27)*

In this connection the suggestions may be mentioned concerning the addition of wetting agents. It

is known, that the wetting ability of mercerizing liquors can be raised by certain special agents. There is no lack of such preparations manufactured by different firms, for instance *"Merzerol"* made by Sandoz and *"Prästabit"* from I. G. Farben-Industrie. From other sides, tar oils and raw creosote oil, alone or in mixtures, are recommended. In short, all substances, which will raise the wetting power of the liquor, come into question.

Still greater interest claim the methods in which the cold refining process is carried out in the presence of an oxidation agent. It appears very justifiable to examine these closer as a special group under the heading of "oxidative mercerization". Perhaps they owe their existence to older patents of Courtaulds *(28)* from the year 1915, which do not directly concern the manufacture of pulp. In these patents, the raising of the ageing velocity of alkali-cellulose by addition of sodium peroxide, hydrogen peroxide, hypochlorite and the like, to the mercerizing liquor is described. Transferring this knowledge to the pulp industry we find in later patents, Waldhof *(29)* Brown Company *(30)* and I. G. Farbenindustrie *(31)* using an oxidation agent during the cold refining treatment of cellulose, whereby, atmospheric oxygen, chlorine, sodium peroxide, and even permanganate are named as suitable agents.

The effect of atmospheric oxygen corresponds very closely to the ageing process of alkali cellulose.

The effects reached in this manner are manifold. First, an oxidative degradation of the viscosity is obtained, favored in its action through the highly swollen, and therefore, highly reactive condition of the cellulose. This can even be carried so far that pulps originate of such low viscosity in solution that the resulting alkali cellulose may be converted immediately, i.e., without allowing for any ageing period into a cellulose xanthate yielding on dissolving a viscose of normal viscosity.

Here we enter the field of the so-called "non-ageing" pulps, which should have a great importance, not only for the viscose process, but also for the lacquer industry. The procedure of oxydative mercerization can also be used for controlling the viscosity of pulp, or in general adjust it to a certain value. In this manner the "quick ageing" pulps can be produced. It is really astonishing that the proposals of Courtaulds have not been employed long ago in the practical manufacture of viscoses. The reasons for it have to be sought perhaps, in its relatively high cost, and in the well known and largely justified, conservative attitude of viscose superintendents. As a further advantage of oxidative mercerization, it must also be added that the resulting pulp exhibits a high degree of whiteness which probably renders the after bleaching stage unnecessary. To avoid this after-bleaching with certainty, one should employ *(32)* a temperature even up to 60 deg. C., during the oxidative mercerization treatment. Further by the use of this method, supposedly a better removal of the pentosans is taking place. Therefore, it is recommended expressly for the manufacture of pentosan-free, highly refined, pulp from beechwood *(33)*.

No matter how simple the chemical foundation for this process of cold refining may be, there still appear to exist considerable difficulties in the equipment and caustic recovery question.

As a suitable way, for example, it is proposed to perform *(34)* the mercerization continuously, whereby the slowly moving pulp sheet is mercerized, squeezed, ripened, and finally washed. The removal of excessive caustic soda liquor may also be accomplished by centrifuging *(35)*.

In general, one has to be aware of the fact that when working in the region of maximum swelling of pulp, the reacting mass represents itself in a form of which it is not easily handled technically. Especially in the moment when liquor and pulp are mixed, the resulting swelling phenomena must cause difficulties.

The Brown Company *(36)* in a Canadian patent appearing two years ago, showed how to overcome this difficulty. They suggest to apply an oxydative liquor at elevated temperature and then cool down, i.e., the mixing is carried out in the region of lower selling and the actual reaction takes place in the range of higher swelling of pulp. According to a series of patents taken out by Papeteries Navarre *(37)*, the pulp is first refined in a battery of diffusers with caustic liquors of rising causticity by a countercurrent method, and then lixiviated with liquors of diminishing concentration.

Taking everything into consideration, one has to raise the question, whether it would not be more economical in the end to use a higher concentrated liquor of say 15 to 18 per cent by weight, which, as such, is more expensive, but just as effective in regard to the removal of hemicelluoses and at the same time causes less swelling of pulp.

The large number of processes characterized by the use of a liquor of about 17.5 per cent NaOH by weight, point to the not very far removed possibility of conducting cold refining processes in a way similar to that of alkali celluose preparation in the viscose industry, whereby the pulp in sheet form is steeped in the well known manner in the mercerizing liquor, and the excess caustic liquor is recovered by pressing. To go a step further, the refining process in the cold could actually be carried out in the alkali cellulose department of a rayon mill, e.g., by modification or repetition of the steeping process.

Whichever way is chosen, the existence of the process concerned hingers upon the possibility of recovering the used liquor, that is, upon the technique and efficiency of the washing process. In the aforementioned procedure described by Papeteries Navarre, the used liquor, according to the countercurrent principle, is again employed for treating new pulp, so that there is obtained besides a practically alkali-free pulp, throughly freed from hemicelluloses, a completely exhausted spent liquor containing all impurities.

Using the steeping-pressing procedure, the pulp-pre-treated with mercerizing liquor, could be treated most suitably in a horizontal press intermittently with liquor or fresh water and pressed between each steeping; therefore, by means of this procedure, the recovery of the caustic liquor in not too low a concentration should be easily possible.

In the centrifuging process *(38)*, the pulp should, of course, we washed in the centrifuge, and the excess liquor also be recovered by centrifuging. Aside from the actual recovery of excessive liquor, certain preventative measures must be taken in order to keep the washed mass from "matting." Such a phenomenon can easily occur if the pulp is suddenly shrunk from a highly swollen condition, and everything points to the fact that preference should be given to processes performing removal of liquor in stages.

The proposal of Wolff and Weingand *(39)* is noteworthy, namely to raise the yield during cold refining by the use of salt e.g., a sodium chloride solution, during the washing procedure; in this way supposedly the new formation of alkali soluble products during the washing process is preventable and an alpha cellulose content of 9.5 per cent can be reached.

Orioli *(40)* recommends an after-washing with a carbonate probably on similar grounds.

The waste liquor, which has been recovered by one way or another must now, pending upon the degree of its impurity, be either partially or completely regenerated by some special process. It is feasible to use for this purpose one of the technically perfected dialysis procedures such as Cerini's Asahi's or others. Apparently it is also possible to regenerate the liquor by freezing out ice and removing it *(41)*.

Another way is indicated by the burning of the liquor and the recovery of sodium hydroxide by causticizing in a manner similar to that of the alkaline pulping process. It has also been proposed to use the waste liquor of the cold refining process as an addition to the sulphate cooking liquor. Brown Company *(42)* possesses a series of patents from which it appears that the cold refining process may be inserted to the best advantage at some point in the alkali cycle of a pulp mill operating with an alkaline process.

Summarizing, one may say, that the cold refining process, which alone comes in question for production of pulp with an alpha cellulose content over 96.5 per cent, in principle should best be linked to some other type of an alkaline process, be it the praparation of alkali cellulose or the sulphate cooking process. We will not be far amiss in suggesting that the future development of this process should take place along these lines.

After washing, the cold refined stock is, if necessary, bleached and then acidified, whereby sulphurous acid *(43)*, sulphites *(44)*, hydrochloric acid *(45)*, sulhuric acid, or oxalic acid *(46)* are supposed to be especially suitable for the removal of iron.

Occasionally, a mechanical after-treatment seems to be necessary on account of the matting previously mentioned, which explains the proposals for treating the stock in rod mills or in a jordan *(47)*.

Viewed generally, the cold process, with a larger expenditure of reagent, supplies pulp of the highest alpha cellulose content, for example, 8 per cent with an almost theoretical yield. At the same time, it must be borne in mind that the cellulose is obtained in a mercerized form, and therefore, requires a special activation for many intended uses. This mercerization effect can be avoided in subdividing refining process into a plurality of stages and operating the last stage within such a temperature range that a mercerization of the fiber does not occur *(48)*.

Cold-Hot and Hot-Cold Processes

In the group of *cold-hot* refining processes, should be inserted all those patents of I. G. Farbenindustrie, etc., mentioned above, in which the pulp is first impregnated in the cold and then cooked.

One American patent *(49)* is especially worth mentioning according to which the pre-mercerized pulp, absolutely free from alkali, is after-cooked with water at 150 deg. C. for the purpose of lowering the viscosity. At the same time, its alpha cellulose content is said to remain at a level of 97 to 98 per cent.

Next the *hot-cold* refining process may be mentioned. Dreyfuss *(50)* tries to obtain a pronounced effect through precooking the pulp first with a 4 per cent caustic liquor at 100 to 150 deg. C. and then after-treating it in the cold with a caustic liquor of higher concentration.

Within the scope of a pulping process for pine wood, suggested by I. G. Farbenindustrie *(51)*, the wood, is at first treated with nitric acid, then with hot dilute caustic soda liquor to remove the nitrolignins, and then, after an intermediate chlorination, the resulting pulp is refined with an 8 per cent caustic soda liquor in the cold, and finally after-bleached.

A patent of Durchman *(52)* also belongs here, which prescribes cooking with a 2 to 5 per cent caustic liquor containing sulphite, subjecting the resulting pulp to an intermediate bleaching stage, and then after-treating it in the cold with a 10 to 14 per cent caustic liquor.

Alkaline-Acid Processes

Among the *alkaline-acid* processes must be mentioned the patents of Brown Company, which are concerned with acid cooking of alpha pulp manufactured by alkaline means for the purpose of producing cellulose powder *(53)*; also the process of Dreyfus *(54)* in which the pulp is pretreated with a 5 per cent caustic liquor and then after-cooked with an alkali bisulphite solution.

The proposals of Schwalbe mentioned at the outset for refining of pulp pretreated with nitric acid, and the processes in which soda and kraft pulp are first cooked *(55)* with a solution containing bisulphite and then refined in the cold, may be inserted here as *acid-alkaline* processes.

One patent of the Brown Company *(56)* appears very odd. In this a way for producing a special refined cellulose, designated for the manufacture of cellulose derivatives is described. The pulp is treated first with cold mercerizing liquor, washed, then after-cooked with 0.1 per cent nitric acid at 100 deg. C. i.e., hydrolized, and then again refined cold. The pulp is supposed to show an alpha cellulose content of 98.5 per cent only 0.9 of pentosans, and moreover, as its most important property, to have an unusually low viscosity.

Again—as when discussing oxydative mercerization—we meet the intention of producing a pulp of low viscosity. For this type of pulp mainly two ranges of application have to be considered: First, quick ageing or not to be aged pulps which are especially suitable for the preparation of cellulose films, and second, a collulose product whose derivatives, because of their ow viscosity, are of great importance to the lacquer industry.

Here, just as in the cold refining process a fundamental question has to be solved. How far should the manufacturer of cellulose products approach the customer in the form of "service to customers," i.e., exactly how far should he carry on the preparation of the pulp, a preparation which actually, in part, ought to be carried out in the factory of the customer? This question will perhaps so solve itself that the pulp manufacturer in time will find ways to reach the effect required by the customer through methods which fit in best with his system of manufacturing. So it should be essentially better for a sulphite pulp mill, for example, to produce pulps of low viscosity through a specific combination of their cooking and bleaching processes, rather than through some other type of process of completely "foreign" nature. At

least this much seems established, that in the United States of America pulp of the lowest viscosity with the highest alpha cellulose content is demanded by many customers and is delivered by certain firms with considerable profit.

Special Applications

The procedures which aim at a purification of pulp by means of phenol, phenolates, fatty acids, acids and copperoxydammonia solutions, need only be mentioned by name.

As a special group, those patents, in which a partial refining, often combined with a mechanical treatment, is carried out for the sole purpose of raising the absorption power of the pulp, have a certain importance. These patents are of recent date and originate from the Imperial Chemical Industry of Australia and New Zealand *(57)* as well as the Brown Company *(58)* and E. I. duPont Company *(59)*. According to these, pulp is treated with an alkaline solution causing a high degree of swelling for only a very short time, i.e., for 15 seconds, and then is quickly washed out. This treatment can be prolonged to a number of hours with an alkaline solution which causes a lower degree of swelling. The pulp so treated yields a very "bulky" i.e., porous sheet which is especially suitable for impregnation, e.g., with latex, for the manufacture of artificial leather. Moreover, such a type of sheet, with a very low density, is ideal for nitration purposes.

Here perhaps belong also the scarcely economical, but interesting process of R. Dosne *(60)* in which the cellulose sheet after mercerization and pressing, but without having been washed, is treated with sulphurous acid. A highly absorptive and very white sheet results.

As far as the adaption of refining method to the use of refined pulp is concerned, the following scheme may be given:

Artificial leather: A highly absorptive, slightly refined pulp.

Viscose rayon manufacture: A normal pulp. If necessary, slightly refined.

Staple fibre manufacture: A pulp which ages somewhat quicker; if necessary, slightly refined.

Viscose film manufacture: A pulp which ages very quickly or does not need any "ageing" at all.

Paper manufacture: Ordinary Papers: Strong, not too highly bleached, slightly refined sulphite pulp.

Cellulose ether manufacture: If necessary, slightly refined pulp. According to the intended use of high, medium or low viscosity.

Nitrocellulose manufacture: Highly absorptive, highly bleached pulp with a high, medium or low viscosity. Slightly refined, loose sheets.

Paper manufacture: For tough, very strong papers with leathery properties: Refined, half bleached Kraft pulp with approximately 3 per cent alpha cellulose.

Rag substitute pulp and moulded products: Hot-refined, highly bleached pulp with 93 to 96 per cent alpha cellulose.

Cuprammonium rayon industry: Very white, hot or cold refined, spruce pulp or pulp from deciduous trees with at least 94 per cent alpha cellulose.

Moisture-resistant cellulose or filaments: (Made by way of Xanthogenate) Very white, hot or cold refined pulp with 96 per cent alpha cellulose content.

Paper manufacture: For soft opaque, printing papers; very white, hot refined alpha pulp of deciduous wood origin.

High-grade cellulose nitrate: Hot refined, highly bleached cellulose with high, medium or low viscosity and 93 to 96 per cent alpha cellulose content. Loose sheets.

Cellulose acetate and cellulose ester: Cold refined, very white, highly absorptive pulp with at least 98 per cent alpha cellulose.

It is a fact that these refining processes, which to a very large extent were originated in Germany, were first built up technically and fully developed in foreign countries. Now it is with great satisfaction, one notes that the German pulp industry has, for a considerable period of timefi returned to the problem with visible success.

Here, no doubt, formerly the lack of economy of the hot process, from the point of view of pulp losses, must have had a restraining influence. It may be assumed, however, that this question will be best solved step by step by the industry itself during the continuous manufacture of large amount of refined pulp.

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Review Of The Paper Industry Literature

Abstracts Compiled By the Abstracts and Bibliography Committee of the Technical Association of the Pulp and Paper Industry, A. Papineau-Couture, John F. Ohlson and Clarence J. West, Chairman of the Committee.

Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C. for 10 cents each. Send currency, not stamps.

Sulphite Process

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Pulping Process. Henry Dreyfus. Brit. pat. 470,341 (Aug. 11, 1937).—Spruce, poplar, pine or other wood or other lignocellulose material, e.g., chemical pulp or semi-pulp, is immersed in a dilute alkali solution at not substantially in excess of room temperature and the material is then heated with a

further alkali solution. If desired, some chlorine may be added to the dilute alkali solution before immersion of the material. The material may be softened before chlorination, e.g., by boiling with a dilute alkali solution or with water under atmospheric or higher pressure. The more resinous types of wood may be treated with cold dilute alkali or an organic solvent, e.g., turpentine, to remove resin, or the resin may be removed by the softening treatment. The alkali solution of the first treatment may be caustic alkali of less than 5 per cent strength. The aftertreatment may be conducted by boiling under atmospheric pressure with dilute alkali, e.g., of the same concentration as that used in the chlorination. The chlorinated material may be boiled with a 1 to 2 per cent solution of sodium sulphite to which sodium hydroxide is added either initially or during the boiling, or a simple sodium hydroxide solution may be used. The aftertreatment may be at superatmospheric pressure and at or below the boiling point of the solution at that pressure. The material may then be given a final bleach. —A.P.-C.

Method of Manufacturing Paper Pulp. Edwin P. Jones, assignor to Champagne Paper Corp. U. S. pats. 2,099,399 and 2,099,400 (Nov. 16, 1937).—*No. 2,099,399*—Linen rags are cooked with about 2.5 to 4 times their weight of a solution containing 1 to 4 per cent of sulphur, 4 to 10 per cent of calcium oxide and 12 to 20 per cent of sodium carbonate (all calculated on the weight of the dry fiber). *No. 2,099-400*—Flax or hemp tow is immersed in water for a sufficient time to dissolve water-soluble ingredients and is then cooked with 2.5 to 4 times its weight of water containing 14 to 20 per cent of sodium hydroxide and 1 to 4 per cent of sulphur (calculated on the weight of dry fiber). (Cl. 92-16)—A.P.-C.

Beech Pulp by Alkaline Cooking Process. G. A. Kienitz. Holz Roh- u. Werkstoff 1, no. 1-2: 30-35 (Oct.-Nov., 1937); B. I. P C. 8:191.—Beech pulp is assuming a place of greater importance in Germany since the increased demands for raw material for production of staple fiber can no longer be supplied entirely by spruce. Although sulfite pulp can be prepared from beech wood, only the cleanest wood free from red heart, frost heart, and black decay, all common defects in this species, can be used. Experiments at Eberswalde indicate the suitability of alkaline cooking by stages to produce a pulp with high alpha cellulose and low hemicellulose content, both desirable characteristics for pulp used in the manufacture of artificial fibers. The procedure described differs from previous methods used in alkaline pulping by stages. The freshly charged wood is treated first with weak black liquor and high pressure (6-10 atmospheres), then progressively, by stages, with stronger black liquor and lower pressures, until in the final stage, fresh liquor and low pressure (0-2 atmospheres) are used. Counterflow is used in washing and probably in practice, would be used in the digesters. A diagram illustrates the set-up of four digesters and five diffusers with the necessary valves, pumps, and pipe lines. Neither liquor ratios nor cooking schedules are given. Staple fibers manufactured from beech pulp prepared by this method equal or excel the best Swedish spruce pulps in their properties.—C.J.W.

Waste Heat Recovery in Sulphate Pulping Process. Paper Industry 19: 1067-1072 (Dec., 1937).—An outline and discussion of the most perfected present-day practice showing that, by proper waste heat recovery, pulp mills can supply all their own steam requirements and have a surplus available, e.g., for the paper mill.—A.P.-C.

Pulping Process. Heintich A. Knopf. Brit. pat. 468,669 (July 9, 1937).—Pulp is prepared from vegetable raw material by use only of a saturated calcium hydroxide solution containing no solid phase or only very small quantities thereof, that are insufficient to cause deposition on the material being treated, the solution being circulated through the fibrous material and being maintained saturated by continuous addition of lime at a rate corresponding to its consumption.—A.P.-C.

Chemical Balance for a Continuous Recausticizing System. O. W. A. Rodowski and C. L. Knowles. Paper Trade J. 105, no 18: 120-122 (Oct. 28, 1937).—A detailed analysis of losses and distribution of chemicals in the No. 2 Dorr continuous causticizing unit at the Savannah, Ga., plant of Union Bag and Paper Corp.—A.P.-C.

Reburning Lime By the Nichols-Herreshoff Furnace. K. A. Forrest. Paper Trade J. 105, no. 18: 113-115 (Oct. 28, 1937).—A description of the mechanism and operation of the Nichols-Herreshoff furnace for reburning lime for making caustic liquid in kraft pulp mills.—A.P.-C.

Heat Balance in Soda Recovery and Combustion Gases. A. Basberg. Papier-J. 25, no. 23: 319-325 (Dec. 15, 1937); B. I. P. C. 8:191.—Theoretical calculations are given concerning the best possible heat utilization in a soda recovery system employing two smelting ovens, disk evaporators and a rotary furnace—C.J.W.

Black Liquors

Determining the Quantities of Rosin Acids in the Waste Water From Sulphate Mills. Hilding Bergstroem and K. G. Trobeck. Svensk Pappers-Tidn. 40, no. 22: 554-555 (Nov. 30, 1937); B. I. P. C. 8:130.—The authors found that unless waste water samples were immediately tested for their content of abietic acids, too low values were obtained. By adding small quantities of potassium or sodium hydroxide to the samples identical results will be obtained even after a period of several months.—C.J.W.

Method for Determining the Rosin Acids in the Black Liquor From Sulphate Mills. Svensk Pappers-Tidn. 40, no. 23: 576 (Dec. 15, 1937); B. I. P. C. 8:192.—A method is described for the quantitative determination of abietic acid with chlorosulphonic acid in waste waters from sulphate mills.—C.J.W.

Continuous Causticizing. Svensk Pappers-Tidn. 40, no. 24: 637-638 (Dec. 31, 1937); B. I. P. C. 8:193.—Brief reference is made to the advantages of continuous causticizing processes in sulphate mills and their economic featibility. A description of the cycle and equipment is given; two diagrams are included.—C.J.W.

Ability to Compete of Norwegian Sulphate Mills in Connection With Modern Heat Utilization. K. Moerch. Paper-J. 25, no. 23: 354, 356, 358, 360, 362, 364, 366, 368 (Dec. 15, 1937); B. I. P. C. 8:192. —In answer to criticisms from the Norwegian press that the sulphate industry of that country was not keeping up with the modernization programs of other countries, and hence not able to compete successfully, with Sweden in particular, the author discusses the so-called soda recovery problems, which were chosen as a special example of where Norway was lagging behind. These problems include the combination of

the best possible recovery of chemicals with the highest possible heat utilization of the organic dry substance in the black lipuor. He reviews the development of disk evaporators, the Sandberg-Sundblad (S.-S.) system, the Tomlinson recovery furnace, and the Lamont system. Of all these, the Tomlinson system is the most efficient apart from high installation cost; however, as yet not very many practical operating data are available. It is most economical when operated in large units and the Swedish opinion is that it becomes profitable at an output of at least 30,000 tons. Disk evaporators and the S.-S. systems are of approximately identical heat economical value. The maximum output per unit is for a daily production of approximately 50 tons. Brief reference is made to the possibilities of these installations for sulphate liquor. In conclusion, the author draws attention to the Norwegian drawbacks and comparatively small units, and much higher raw material and labor costs than in Sweden.—C.J.W.

Tall Oil Fat Acids With Regard to Chemistry and Paint Technology. H. Niesen. Fette u. Seifen 44: 426-432 (1937); C. A. 32:1121.—Tall oil (Wijs number 188.2, acid number 179.65, refractive index 1.4958, density 0.9589, molecular weight 300, resin content 32.78 per cent) was separated into fat and resin acids. This was done by refluxing the tall oil with methyl alcohol and sulphuric acid for 2-3 minutes and taking up the methyl esters of the fat acids in petroleum ether while the unesterified resin acids are removed with aqueous sodium hydroxide solution. On saponifying the fat acid methyl esters so obtained, a mixture of fat acids consisting of 5 per oleic acid, 79 per cent linoleic acid and 6 per cent linolenic acid was obtained. The resin acids had the constants: Hüby iodine number 160.3, Rast molecular weight 301.5, acid number 185.5, and consisted mainly of pinabietic acid. Paints made from the glycerides of the tall oil dried more slowly and yielded films greatly inferior to paints prepared with the tall oil fat acid glycerides but the latter did not dry as well nor did the dried film give off absorbed water as rapidly as paints made with linseed oil or linseed stand oil. The advantages of removing the resin acids from the tall oil before using it in making paint products are emphasized.—C.J.W.

Tall Oil Fat Acids With Regard to Chemistry and Paint Technology. H. Heller. Fette u. Seifen 44:486 (1937); C. A. 32:1121.—The advantages of using a high-vacuum steam distillation for purifying tall oil fat acids and of preparing their glycerides in a stream of nitrogen are emphasized.—C.J.W.

Mechanical Process

Grinding Problems. J. K. Sandmo. Papir-J. 25, no. 23: 328-329 (Dec. 15, 1937); B. I. P. C. 8:201.—The author questions the correctness of the statement that better pulp is obtained by hot than by cold grinding. According to his experience, power consumption is about the same in both cases. Considering the high pressures required in the Masonite process for separating the fibers, it seems hardly possible that temperatures up to 80 deg. C. as used in hot grinding should have a similar explosive effect. The greater length of hot ground fibers can probably be traced back to the fact that wood becomes tougher and more pliable under the influence of moisture and heat, whereas the fibers at low temperatures are brittle and more apt to break into small fragments. High temperatures favor the dissolving of the soluble substances in wood and cause a quicker yellowing of the pulp, especially under influence of sunlight, followed by a weakening of the strength properties of the fiber.—C.J.W.

Effect of the Viscosity of the Grinding Medium in the Mechanical Pulping Process. E. R. Schafer and J. C. Pew. Paper Trade J. 105, no. 18: 116-118 (Oct. 28, 1937).—When a normal consistency of pulp is maintained constant, an increase in pit temperature results in longer-fibered stronger pulps at decreased energy consumption. These effects tend to diminish when a fixed viscosity accompanies an elevation in temperature, indicating that viscosity changes, in part at least, are responsible.—A.P.-C.

Grinding of Loblolly Pine. Relation of Wood Properties and Grinding Conditions to Pulp and Paper Quality. E. R. Schafer, J. C. Pew and C. E. Curran. Paper Trade J. 105, no. 21: 41-48 (Nov. 18, 1937).—Experiments are reported which confirm the feasibility of making satisfactory groundwood from southern pine if the wood is properly selected and grinding conditions carefully controlled. —A.P.-C.

Miscellaneous Dirgesting Processes

Production of Cellulose. I. G. Farbenindustrie A. G. Brit. pat. 468,388 (July 2, 1937).—In opening up vegetable fibrous material by means of nitric acid, the material is covered in a pressure vessel with weak acid (2 to 7 per cent by volume) applied under reduced pressure, the initial temperature being 40 to 60 degs. C., and the temperature is raised to about 70 to 90 degs. C. in the course of some hours; when an excess pressure, preferably of several atmospheres, has been produced, the pressure is maintained until the end of the reaction, whereupon the material is washed and subjected to an ordinary alkaline after-treatment, e.g., with a 2.5 per cent sodium hydroxide solution at 70 to 90 degs. C.—A.P.-C.

The Cooking Process. X. Pulping Wood With Alcoholic Nitric Acid Solutions. S. I. Aronovsky and Ross Aiken Gortner. Ind. Eng. Chem. 29: 1431-1434 (Dec., 1937).—A series of cooks was made on aspen and jack pine sawdust and chips by refluxing with aqueous and alcoholic (ethyl and *n*-butyl) solutions of nitric acid, followed by boiling the acid-treated wood with dilute sodium hydroxide solutions. The concentrations of the acid and alkali as well as the duration of the treatment were varied. A number of cooks were also run with mixtures of aqueous and alcoholic nitric acid and with alcoholic solution of sulphur dioxide and lithium bisulphite. The alcoholic nitric acid solutions gave much higher yields of good pulp than were obtained with the aqueous acid under similar pulping conditions. Increasing the concentration of the acid resulted in lower total yields but gave larger yields of screened pulp. Dilution of the alcoholic solutions with water had but little effect on the yields of pulp. Jack pine did not pulp as readily as aspen. Soda ash was not as efficient as sodium hydroxide in removing the compounds formed by the action of nitric acid on wood. Sulphur dioxide and bisulphites in alcohol were not efficient pulping agents. —A.P.-C.

Pulping Process. Adam Hoche, assignor to Cellulose Research, Inc. U. S. pat. 2,095,194 (Oct. 5, 1937).—The material is treated at atmospheric pressure for from 40 mins. to 2 hrs. with sufficient 40 to

45 degs. Baumé nitric acid to cover the mass, and in presence of about 1 to 8 lb. of sugar, starch or molasses per ton of fibrous raw material. (Cl. 92-9).—A.P.-C.

Preparation of Straw Cellulose. II. Treatment With Chlorine Gas and Sodium Hydroxide. T. Kimura. J. Cellulose Inst. Tokyo 13: 311-318 (1937)—Rice straw was treated with aqueous sodium hydroxide at 97 or 140 degs. C., exposed to chlorine gas, and finally again treated with aqueous sodium hydroxide for 30 min. at 97 degs. Pretreatment with water alone did not yield a good cellulose and with sodium hydroxide 97 degs. was better than 140 degs. C.; increasing the amount of sodium hydroxide increased the consumption of sodium hydroxide and decreased that of chlorine. With undiluted chlorine chlorination was complete in 30 min., but when the chlorine was diluted with air much longer time was required.—A.P.-C.

Sizing

Influence of Solvent on the Saponification Num- of Rosin. W. C. Smith. Ind. Eng. Chem. Anal. Ed. 9: 469-471 (Oct., 1937).—The saponification number of rosin is influenced by the solvent used in the determination, alcohols of the higher molecular weights giving the higher values. A method for the complete saponification of rosin will be of scientific value in determining its composition and nature; from a commercial standpoint it is not essential, since industrial saponification of rosin is carried out in aqueous solutions of alkali; a method to be of a maximum commercial value should simulate the procedure used industrially.—A.P.-C.

Starch in Paper. H. N. Lee. Paper Industry 19: 785-794 (Oct., 1937).—A detailed description of the actual appearance and distribution of starch and starch products in paper, together with a few variations due to different conditions and indications of possibilities of extending investigations; illustrated wth 28 figures, of which 4 color microphotographs.—A.P.-C.

Paraffin Emulsions. Ernest E. Mayer. Brit. pat. 466,510 (May 31, 1937).—Aqueous emulsions are obtained by heating paraffin wax with an emulsifying wax and a preformed 10 per cent rosin soap solution, the total water present during emulsification being 20 to 50 per cent of the weight of the mixture and the emulsification being conducted without the use of colloid mills or high-speed stirring apparatus. Other materials, e.g., starch, animal glue, fungicides, dyes, may be added during the emulsification or as emulsions to the wax emulsion. The products may be used for beater- and surface-sizing of paper and paper pulp and for impregnating and coating porous materials, paper, wood and stone.—A.P.-C.

Dr. Harris to Study Pulp in U. S.

VANCOUVER, B. C., May 21, 1938—Commencing his investigation into the use of British Columbia wood in new chemical processes, Dr. Allen Harris of the University of British Columbia, will make a study of these processes in actual use in the United States.

After a conference with Hon. W. J. Asselstine, minister of trade and industry, who launched this enquiry, Dr. Harris is now visiting pulping plants on Puget Sound. He will also go to the University of Washington in Seattle, which maintains one of the best forest laboratories in the United States.

The object of these enquiries is to discover why it is that commercial pulping and wood chemistry has made enormous strides in Washington and Oregon in late years but not in British Columbia. Dr. Harris will find out in detail the costs of operating of this sort of plants in the United States in such items as wages, power and taxes, as compared with costs here. This is thought to be one of the keys to the problem of wood utilization, which Mr. Asselstine considers of major importance in the future of British Columbia.

Armed with information on the situation in the United States, Dr. Harris will confer with sawmill men and timber operators in British Columbia to discuss with them the problems confronting any concern desiring to engage in new wood industries here.

He plans also an early trip to the state forest laboratory of Idaho, where much research work valuable to British Columbia has been done of late years. From there he will go to Madison, Wis., to the United States Government's Forest Products Laboratory, the largest plant in the world devoted to wood studies. From these laboratories he hopes to get scientific data on which to base a report to the government on the possibilities of new wood industries here.

"I am convinced," Dr. Harris said, "that the manufacture of cellulose will be the world's largest industry within a few years. Cellulose can be used, you might almost say, for any purpose, from paper to sugar. They are eating in Germany today bread and candy made largely of cellulose products. British Columbia must get into this industry, must develop markets for its cellulose, if it wants to maintain its prosperity in the future. In our forests we have the best producer of cellulose that we know of and we must find ways of using it."

TAPPI Notes

The Kalamazoo Valley Section, of the Technical Association of the Pulp and Paper Industry, will meet at the Gull Lake Country Club, Kalamazoo, Mich., Thursday, June 2, 1938. L. G. Jarrett, of the J. O. Ross Engineering Corporation, will talk on "Tons of Air for Drying Paper". Preceding the dinner will be a golf tournament and swimming.

The Empire State Section of TAPPI will meet at the Hotel Woodruff, Watertown, N. Y., June 4, 1938. Officers will be elected and a group of papers presented. There will be a golf tournament in the afternoon.

The Delaware Valley Section of TAPPI will hold a dinner-dance at the Bala Country Club, Philadelphia, Pa., Friday, June 17, 1938.

The Technical Section of the Canadian Pulp and Paper Association will meet on June 9th, at Cornwall, Ontario, and on June 10-11, 1938, at the Seigniory Club. Members of TAPPI are invited.

The Pacific Section of TAPPI will hold its annual meeting (joint meeting with Superintendents Association) at the Benson Hotel, Portland, Ore., June 3-4, 1938.

The fall meeting of the Technical Association will be held at Green Bay, Wis., Sept. 8-10, 1938. Reservations should be made with A. D. Murphy, Green Bay Association of Commerce.

The American Chemical Society will meet at Milwaukee, Wis., September 5-9, 1938.

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Financing and Operation of Pulp and Paper Mills

General Construction News

New Haven, Conn.—The National Folding Box Company, Alton and James streets, manufacturer of paper boxes and containers, has approved plans for alterations and improvements in power house, with installation of additional equipment. Contract for building work has been let to the E. & F. Construction Company, 94 Wells street, Bridgeport, Conn., and work will be placed under way at once. Cost estimated close to $45,000, with equipment. Frederick L. Smith, 21 East Fortieth street, New York, N. Y., is consulting engineer.

Eau Claire, Mich.—Modern Pac, Inc., manufacturer of corrugated fiber board fruit packages, has completed construction of new local plant, previously referred to in these columns, and will occupy for increased production. For a number of months the company has been using a smaller building under limited manufacturing schedule. The company has placed a two-shift basis in operation at new plant and will advance this to a three-shift schedule at early date. C. H. Richards and F. A. Bowerman are in charge of operations at mill, which is said to represent an investment of close to $40,000.

Cambridge, Mass.—The National Paper Bag Company, 332 Binney street, recently organized with capital of 5,000 shares of stock, no par value, plans early operation of local plant for the manufacture of paper bags and containers. New company is headed by Abraham Newman, president, and Louis Wolf, treasurer.

Jarratt, Va.—The Johns-Manville Corporation, 22 East 40th street, New York, N. Y., manufacturer of insulating board and kindred materials, roofing products, etc., has awarded general erection contract to the Consolidated Engineering Company, 20 East Franklin street, Baltimore, Md., for new mill at Jarratt, recently referred to in these columns; an award for structural steel framing, totaling about 1500 tons of steel shapes, was recently let to the Belmont Iron Works, Eddystone, Philadelphia, Pa., and early delivery of material on site is scheduled. Initial plant will consist of three main buildings, including a one-story pulp mill, 240 x 240 feet; a one-story dryer building, 240 x 500 feet; and another main mill unit, one-story, 240 x 520 feet. New plant will be given over exclusively to the manufacture of insulating board products from wood pulp, and is estimated to cost about $1,000,000, with equipment. Company has a tract of about 140 acres of land at location noted. A pulpwood procurement program is now being inaugurated, with view to securing large raw material supply. The Stone & Webster Engineering Corportion, 49 Federal street, Boston, Mass., is consulting engineer for project and will supervise erection.

Niagara Falls, N. Y.—The Electric City Paper Mills, Inc., Adams street, manufacturer of wrapping, lining and other paper stocks, has asked bids on general erection contract for rebuilding of portion of two-story mill, recently destroyed by fire, used for tar paper and affiliated divisions of production. Work is estimated to cost about $35,000, with equipment.

Beaumont, Tex.—Thomas M. Royal & Co., Seventh street and Grange avenue, Philadelphia, Pa., manufacturer of paper bags and containers, will specialize largely in the production of waxed paper bags and similar stocks at new paper converting plant in building at Main and Gilbert streets, Beaumont, where property recently was leased, as noted in these columns. Orders are being placed for machinery and installation is scheduled to be made at early date. Victor Ambler will be local manager at plant.

Binghamton, N. Y.—The Afga-Ansco Corporation, 29 Charles street, manufacturer of photographic papers, films, etc., has completed plans for new addition to air-conditioning and steam heating plant, to include installation of additional equipment. Bids are being asked on general erection contract and work is scheduled to begin soon. No estimate of cost has been announced. Lockwood, Greene Engineers, Inc., 30 Rockefeller Plaza, New York, N. Y., is architect and engineer, and will supervise installation.

Kalamazoo, Mich.—The Detroit Paper Products Corporation, 5800 Domine street, Detroit, Mich., has active work in progress on improvements in paper mill division at Kalamazoo plant, including facilities for improved production. The program will be pushed to early completion. Company is maintaining a good production scheduled in its corrugated board division at the local mill, where operations were started late last year and present manufacturing basis is expected to be maintained for an indefinite period.

Marrero, La.—The Paper Makers Chemical Division of Hercules Powder Company, Wilmington, Del., has plans for new addition to mill at Marrero, near New Orleans, to be one-story, 25 x 75 feet. New unit will be used as a change house and for shop service. Bids are being asked on general erection contract and work is scheduled to begin soon. No estimate of cost has been announced.

Burbank, Cal.—Cinecolor, Inc., 201 North Occidental boulevard, Los Angeles, Cal., manufacturer of

color films, has approved plans for construction of a new one-story and basement film-manufacturing plant at 2728 South Olive street, Burbank, to be 100 x 250 feet, devoted exclusively to purpose noted. It is estimated to cost close to $140,000, with processing and other equipment. R. V. Derrah, 9470 Santa Monica boulevard, Beverly Hills, Cal., is architect.

Vancouver, B. C.—The Nootka Wood Products, Ltd., Vancouver, A. E. McMaster, managing director, has preliminary plans under way for construction of a new mill at Port Tasis, on the west coast of Vancouver Island, for the production of rayon pulp. Plant will comprise several large one and multi-story units, with power house, machine shop and other mechanical divisions. It is reported to cost over $2,000,000, with machinery. It is proposed to carry out financing for the project in near future.

Mexico, D. F.—Productora e Importadora de Papel, S. A. "Pipsa", a Mexican Government subsidized company, has plans maturing for a large pulp and paper mill at Toluca, where tract of land has been selected. It will comprise divisions for wood pulp and paper production, as cellulose sulphite and cellulose chloride, consisting of a group of units, equipped for a gross capacity of close to 170 metric tons per day. No estimate or cost has been announced, but reported in excess of $1,500,000, with machinery. It is proposed to commence work on project at early date.

New Companies

Wilmington, Del.—The Hogan Paper and Manufacturing Company has been chartered in Delaware, under direction of the Colonial Charter Company, Citizens' Bank Building, Wilmington, with capital of $125,000, to manufacture pulp and paper products of various kinds.

Los Angeles, Cal.—The Golden State Paper Company, 1807 East Olympic boulevard, has filed notice of organization to deal in paper products of various character. Company is headed by Maurice E. Maltby, 4680 East Gage avenue, and Lawrence L. Price, 2107 West Eighty-fourth street, both Los Angeles.

Syracuse, N. Y.—The F. & J. Tablet Company, Inc., has been incorporated with capital of 100 shares of stock, no par value, to manufacture and deal in paper tablets and other converted paper specialties. New company is represented by James F. Burns, Jr., Herald Building, Syracuse, attorney.

Boston Paper Men to Hold Outing

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., May 23, 1938—Members of the Boston Paper Trade Association are looking forward to the regular June meeting and outing of the organization, June 6, to be held, as for years, at the Charles River Country Club, Newton Centre, Mass., where they have always had a good time.

The program includes a regular buffet luncheon, to be served at the Locker Building from 11:30 A. M. on. Dinner will be served at 6:45 P. M., after which the prizes to the winners of the various events will be awarded. The facilities of the club will be at the disposal of the members of the association and their guests all day.

The outdoor sports will start at 2 o'clock sharp and continue through the entire afternoon.

This is the 17th year's play for the handsome silver Golf Championship Cup offered by the Boston Paper Trade Association. It must be won three times to become the permanent property of the winner. Meanwhile it will remain in the custody of the best net score each year until the succeeding year's play and until such time as someone shall have won it three times. Provided two or more tie for the cup, the method of play-off will be determined by the committee. No player in handicap competition shall receive more than one prize.

Winners of the Association Championship Cup are as follows:

Charles A. Esty, William N. Stetson, Jr., Asaph Churchill, John Munro, E. Lindsey Cummings, Edward Bement, William N. Stetson, Jr., Norman Harrower, Roger B. Taft, E. Edwin Porter, Jr., John R. Whitney, W. H. Anders, John Munro, John R. Whitney, W. Edwin Porter, Jr., and Everett Ketcham.

A prize will be awarded for the best net in a Guest's Handicap Tournament. There will be prizes for special events for guests. No man can receive more than one prize.

The golf committee is composed of W. J. McLellan, chairman, E. D. Bement, Nelson Feeley, Fred Korbel and W. Edwin Porter, Jr.

Government Paper Bids

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., May 25, 1938—The Government Printing Office has received the following bids for 1,000 pounds of vegetable parchment paper for Tympan use in 48" rolls; Whitaker Paper Company, 16.75 cents; Patterson Parchment Paper Company, 28 cents less 2 per cent; Reese & Reese, Inc., 14.95 cents; and Mathers-Lamm Paper Company, 15.25 cents.

For 46,000 pounds of offset paper; Stanford Paper Company, 6.38 cents; John F. Post, Inc., 6.15 cents; Whitaker Paper Company, 6.3 cents; Walker, Goulard Plehn Company, Inc., 6.28 cents; Barton, Duer & Koch Paper Company, 5.79 cents; Mathers-Lamm Paper Company, 5.94 cents; R. P. Andrews Paper Company, 6.06 cents; Aetna Paper Company, 5.73 cents; Butler Company, 6.3 cents; Reese & Reese, Inc., 5.89 cents; Old Dominion Paper Company, 6,849 cents; Cauthorne Paper Company, Inc., 5.87 cents; Marquette Paper Company, 6 cents; and Paper Corp., of U. S., 5.93 cents.

For 23,000 pounds (100,000 sheets) of 22½ x 28½ white sulphite index; Virginia Paper Company, 5.88 cents; Stanford Paper Company, 6.44 cents; R. P. Andrews Paper Company, 5.93 cents; Barton, Duer & Koch Paper Company, 5.85 cents; and Whitaker Paper Company, 6.27 cents.

Reforestation Program Progresses

ALBANY, N. Y., May 23, 1938—The 1938 reforestation program for this state is reported nearly one-sixth complete and far ahead of schedules with 1,826,439 new trees in the ground. Conservation Commissioners claim that an early spring had speeded the planting. With completion of this year's program it was stated that more than 260,000 of the 379,197 acres to be reforested will have been covered. Plantings thus far range from 50,000 trees in Schoharie county to 420,000 in Franklin and St. Lawrence counties.

Imports of Paper and Paper Stock

Giving Manifests of New York, Boston, Philadelphia and Other Ports, of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard, Wallboard, Cigarette Papers, Sulphite, Kraft and Ground Wood Pulp.

NEW YORK IMPORTS

WEEK ENDING MAY 21, 1938

SUMMARY

Cigarette paper ..... 277 cs.
Wall paper ..... 3 cs.
Paper hangings ..... 5 bls., 1 cs.
Newsprint ..... 11,416 rolls
Printing paper ..... 148 rolls, 117 cs.
Wrapping paper ..... 5 cs.
Drawing paper ..... 12 cs.
Filter paper ..... 6 cs
Filter mass ..... 100 bls.
Surface coated paper ..... 108 cs.
Decalcomania paper ..... 4 cs., 9 drums
Decalcomanias ..... 27 cs.
Transfer pictures ..... 4 cs.
Transfer paper ..... 2 cs.
Wood pulp paper ..... 36 bls.
Colored paper ..... 4 cs.
Paper tubes ..... 47 cs., 71 ctns.
Miscellaneous paper ..... 26 cs.

CIGARETTE PAPER

Champagne Paper Corp., *Collamer,* Bordeaux, 263 cs.
De Manduit Paper Corp., *Normandie,* Havre, 2 cs.
Braunstein Freres, Inc., *Normandie,* Havre, 12 cs.

WALL PAPER

——, *Europa,* Bremen, 3 cs.

PAPER HANGINGS

W. H. S. Lloyd & Co., *American Trader,* London, 5 bls., 1 cs.

NEWSPRINT

International Paper Co., *International #1,* Gatineau, 315 rolls.
International Paper Co., *G.T.D.,* Gatineau, 314 rolls.
Daily Mirror, *A.C.D.,* Donnacona, 227 rolls.
N. Y. Evening Journal, *A.C.D.,* Donnacona, 96 rolls.
N. Y. Evening Journal, *Markland,* Liverpool, N.S., 311 rolls.
N. Y. Tribune, *Markland,* Liverpool, N.S., 1507 rolls.
World Telegram, *Markland,* Liverpool, N.S., 577 rolls.
Brooklyn Daily Eagle, *Markland,* Liverpool, N. S., 444 rolls.
Herald Statesman, *Markland,* Liverpool, N.S., 60 rolls.
South Norwalk Sentinel, *Markland,* Liverpool, N.S., 68 rolls.
N. Y. Post, *Markland,* Liverpool, N.S., 818 rolls.
News Syndicate Co., *Louisianan,* Baie Comeau, 5370 rolls.
H. G. Craig & Co. Inc., *G.D.D.,* Donnacona, 309 rolls.
Jay Madden Corp., *Columbus,* Bremen, 581 rolls.
Jay Madden Corp., *Hamburg,* Hamburg, 354 rolls.
——, *Hamburg,* Hamburg, 65 rolls.

PRINTING PAPER

Dingelstedt & Co., *Europa,* Bremen, 32 cs., 15 rolls.
Dingelstedt & Co., *Columbus,* Bremen, 105 rolls, 28 cs.
F. C. Strype, *Black Osprey,* Rotterdam, 28 rolls, 7 cs.
E. Dietzgen & Co., *Hamburg,* Hamburg, 50 cs.

WRAPPING PAPER

R. McBratney Co. Inc., *Caledonia,* Glasgow, 1 cs.
Titan Shipping Co., *American Trader,* London, 1 cs.
Japan Paper Co., *Gerolstein,* Antwerp, 3 cs.

DRAWING PAPER

H. Reeve Angel & Co. Inc., *American Trader,* London, 2 cs.
C. Bruning Co. Inc., *Columbus,* Bremen, 10 cs.

FILTER PAPER

H. Reeve Angel & Co. Inc., *American Trader,* London, 6 cs.

FILTER MASS

A. W. Fenton, Co., *Columbus,* Bremen, 100 bls.

SURFACE COATED PAPER

Moller Kokeritz & Co., *Columbus,* Bremen, 5 cs.
Gevaert Co. of America, *Black Osprey,* Antwerp, 103 cs.

DECALCOMANIA PAPER

B. F. Drakenfeld & Co., *Samaria,* Liverpool, 4 cs., 9 drums, (duplex).

DECALCOMANIAS

Phoenix Shipping Co., *Europa,* Bremen, 2 cs.
——, *Columbus,* Bremen, 1 cs.
Sellers Transportation Co., *Europa,* Bremen, 22 cs.
Sellers Transportation Co., *Columbus,* Bremen, 2 cs.

TRANSFER PICTURES

Rohner Gehrig & Co., *Europa,* Bremen, 4 cs.

TRANSFER PAPER

Fuchs & Lang Manfg Co., *Hamburg,* Hamburg, 2 cs.

WOODPULP PAPER

A. Giese & Son, *N. Amsterdam,* Rotterdam, 36 bls.

COLORED PAPER

D. C. Andrews & Co., *Columbus,* Bremen, 4 cs.

PAPER TUBES

——, *Columbus,* Bremen, 47 cs., 71 ctns.

MISCELLANEOUS PAPER

T. N. Fairbanks Co., *Normandie,* Havre, 4 cs.
Coty Inc., *Normandie,* Havre, 7 cs.
Winsor & Newton, Inc., *American Trader,* London, 10 cs.
Massce & Co., *Europa,* Bremen, 4 cs.
Dingelstedt & Co., *Gerolstein,* Antwerp, 1 cs.

RAGS, BAGGINGS, ETC.

E. J. Keller Co. Inc., *Collamer,* ——, 61 bls. rags.
D. M. Hicks, Inc., *Collamer,* Havre, 35 bls. rags.
Chase National Bank, *Collamer,* Bordeaux, 30 bls. rags.
——, *Kinai Maru,* Kobe, 50 bls. rags.
J. Cohen & Son Co. Inc., *Samaria,* Liverpool, 14 bls. paper stock.
Manufacturers Trust Co., *Samaria,* Liverpool, 58 bls. rags.
Burka Bagging Co. Inc., *Fort Townshend,* Halifax, 110 bls. bagging.
Royal Manfg Co., *Black Osprey,* Antwerp, 101 bls. cotton waste.
Royal Manfg Co., *Norden,* Kobe, 58 bls. rags.
Irving Trust Co., *Hamburg,* Hamburg, 208 bls. jute waste.
E. J. Keller Co. Inc., *Vincent,* ——, 116 bls. bagging.

BONE GLUE

L. Lederer, *Bilderdyk,* Rotterdam, 100 bags.

OLD ROPE

W. Steck & Co., *Bilderdyk,* Rotterdam, 44 coils.

WOOD PULP

A. Geise & Son, *N. Amsterdam,* Rotterdam, 40 bls. wood pulp.
——, *Saturnia,* Trieste, 80 bls. wood pulp.
Absorbo Beer Pad Co., *Hamburg,* Hamburg, 501 bls. wood pulp, 53 tons.
——, *Stavangerfjord,* Drammen, 250 bls. sulphite.

WOOD PULP BOARDS

——, *Hamburg,* Hamburg, 10 rolls.

ALBANY IMPORTS

WEEK ENDING MAY 21, 1938

Halifax Power & Pulp Co. Ltd., *Songdal,* Sheet Harbor, 10,069 bls. ground wood pulp, 2,251 tons.
Halifax Power & Pulp Co. Ltd., *Songdal,* Sheet Harbor, 281 bls. ground wood pulp screenings, 63 tons.

BOSTON IMPORTS

WEEK ENDING MAY 21, 1938

Price & Pierce, Ltd., *Etna,* ———, 5,100 bls. unbleached sulphite.
Price & Pierce, Ltd., *Etna,* ———, 690 bls. unbleached sulphate.

PHILADELPHIA IMPORTS

WEEK ENDING MAY 21, 1938

Castle & Overton, Inc., *Collamer,* Havre, 42 bls. rags.
E. J. Keller Co. Inc., *Collamer,* ———, 74 bls. rags, 51 bls. new cuttings.
Philadelphia Record, *Markland,* Liverpool, N.S., 1,163 rolls newsprint.
———, *Kinai Maru,* Kobe, 25 bls. rags.
E. J. Keller Co. Inc., *Black Osprey,* ———, 163 bls. rags.
J. M. Hagy Waste Works, *Black Osprey,* Rotterdam, 43 bls. rags.
Masting & Co., *Vincent,* Havre, 1 ble drawing paper.
Gottesman & Co. Inc., *Gonzenheim,* Sweden, 875 bls. unbleached sulphite.

BALTIMORE IMPORTS

WEEK ENDING MAY 21, 1938

Gottesman & Co. Inc., *Gonzenheim,* Sweden, 375 bls. unbleached sulphite.

NORFOLK IMPORTS

WEEK ENDING MAY 21, 1938

N. Y. Trust Co., *Collamer,* Havre, 250 bls. bagging.
Irving Trust Co., *Waukegan,* Glasgow, 86 bls. paper stock.

Internal Combustion Engines

A new thirty-six page booklet, illustrating various installations of Diesel and gas engines, was recently published by Worthington Pump and Machinery Corporation of Harrison, N. J. Among the first in America to build internal combustion engines, Worthington pictures in this new publication the extensive application of Diesel and gas engines in every field where power is an essential factor. In a period of forty years, Worthington has furnished over a million horsepower in units of all types.

Worthington Diesel engines are of the heavy duty type, ranging from 50 to 1500 horsepower at speeds from 225 to 600 r.p.m. The modern vertical four-cycle single-acting direct-injection design is the result of experience in building all types of engines: horizontal and vertical; two-cycle and four-cycle; single-acting and double-acting and air-injection and direct-injection, and is generally accepted as offering the highest attainable operating economy and reliability.

Worthington gas engines range in size from 30 to 1800 horsepower, and are designed to operate on natural, manufactured, refinery, sewage-sludge, producer or any mixture of gases. The characteristics of Worthington's vertical gas engines follow closely those of its Diesel engines, while the horizontal double-acting gas engines operate at speeds from 125 to 200 r.p.m. Widely used on gas compressor service, the latter are also suitable for general power requirements where gas fuel is available.

The new Worthington bulletin contains nearly one hundred illustrations of Worthington engines in service, demonstrating their wide range of sizes and services.

Start Certified Products Bureau

The Gummed Industries Association has established an independent Certified Products Bureau designed permanently to insure the maintenance of quality standards in the industry and effectively to combat the manufacturing and distributing of sub-standard sealing tape products under misleading quality endorsements.

The services of the bureau will be available to all subscribers. It will maintain an extensive laboratory where standards not only will be determined and regulated, but where consumers and distributors may send products received for quality verifications, assuring the preservation of standards once set.

To members whose products conform with bureau standards, the bureau will offer the use of a new copyrighted label which is to be a hall-mark of quality for all products consistently meeting specifications. When the standards of any endorsed product drop below these specifications the bureau shall, through a suitable procedure wherein the manufacturer will be allowed to present extenuating circumstances, deny the use of the label to the product.

The establishment of the bureau is not intended as a criticism of the activity of the Bureau of Standards of the United States Department of Commerce, through which in 1930 recommendations for a physical property test for No. 1 Kraft Sealing Tape were made and a Simplified Practice Label offered to conforming goods. Though the program set minimum standards of paper property, length, width and aimed to standardize the packaging of these objects, it failed to establish an adequate guard against violation, and sub-standard manufacturers have been able to distribute tape short of length, width and of inferior paper quality under the unmerited endorsement of the Simplified Practice Label.

The root of the evil, which has worked for the substantial injury of the industry as a whole, has lain not with the Department of Commerce, but with the failure of members of the industry to realize their responsibility in maintaining standards against violation and evasion, and with the practical difficulties in their way. The Certified Products Bureau will give the industry for the first time, the opportunity of uniting to preserve its own standards of quality, and will offer all the practical facilities necessary for such action.

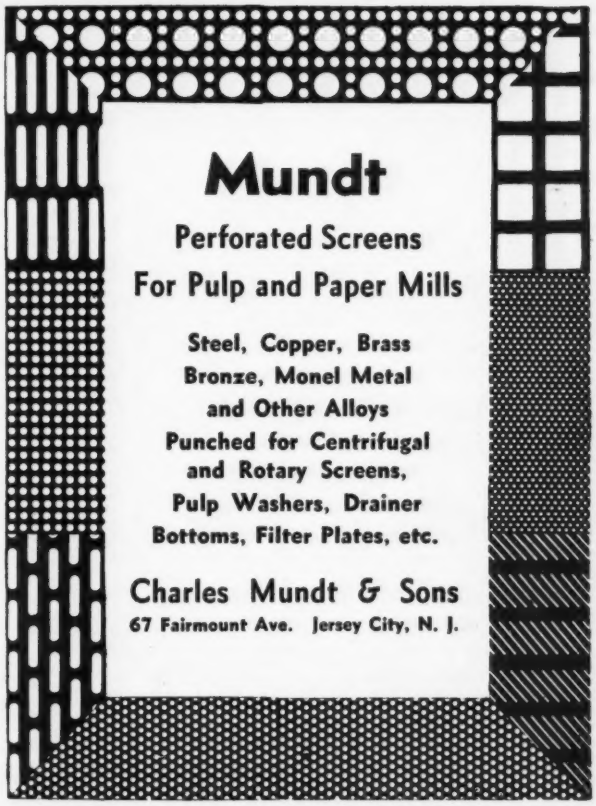
The bureau is self-supporting, except for such grants as it may receive from time to time from the Gummed Industries Association, and it will be maintained by assessments pro-rated among its members. Membership, divided into various classes, is open to manufacturers, trade associations, paper merchants and consumers. A set of by-laws describing in detail the purpose, functions, limits and qualifications of the bureau is now available.

Manufacturers who are members may submit products for bureau endorsement at any time and to products conforming with its specifications, the Bureau will authorize the use of the Certified Products Label, which the product may bear as long as its quality remains intact. Other members may submit products for service reports. To all concerned with each report made the bureau will send the data included in the report. Forfeiture of the label at any time shall be no bar against its being re-granted whenever the delinquent product conforms to specifications.

for Producing Bag Rolls, Shipping Rolls
Counter Rolls, Board Rolls, etc.
CAMACHINE
18
CAMERON MACHINE COMPANY
61 POPLAR ST., BROOKLYN, N. Y.

More Service Hours
WALDRON PAPER ROLLS
Most Paper Rolls are bought on the basis of "Utilization Cost." That is why keen buyers standardize on Waldron Rolls. Built to give trouble-free service over a greater number of service hours, they continue to prove most economical to buy and use. Try Waldron Rolls.
OVER A CENTURY OF EXPERIENCE BUILDING PAPER CONVERTING MACHINES
JOHN WALDRON CORPORATION
Main Office and Works: NEW BRUNSWICK, N. J.
Chicago New York Portland, Ore.

DURABILITY*
"Century Line" flat & square bag machine.
Excerpt from a letter —
* . . . From the day these machines were installed, we have had trouble-free runs and as the production of paper bags was a new venture to us, it speaks well of the simplicity of the construction of your machines and thoroughness of your POTDEVIN plant . . .
PAPER BAG MACHINERY
PRINTING PRESSES, WAXING MACHINES
POTDEVIN MACHINE CO.
1223 38th Street
Brooklyn, N. Y.
Est. 1893
POTDEVIN


Mundt
Perforated Screens
For Pulp and Paper Mills
Steel, Copper, Brass
Bronze, Monel Metal
and Other Alloys
Punched for Centrifugal
and Rotary Screens,
Pulp Washers, Drainer
Bottoms, Filter Plates, etc.
Charles Mundt & Sons
67 Fairmount Ave. Jersey City, N. J.

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday May 25, 1938.

The wholesale paper market reports demand for many grades of paper as holding up well during the current week. Distribution of paper and paper products continues at a relatively high level when compared with other forms of consumer goods. An approximate estimate of the general wholesale activity of the nation, based on the Federal Reserve's report of check payments, indicates a decline of about 7.78 per cent in April, compared to the corresponding period last year.

Wholesale volume in New York has been and continues to be better than the national average, while wholesale activity in Philadelphia and Boston, as indicated by the same source, is below it, and Chicago business about equals the national average. Prices continue relatively firm in the New York market and with the exception of board prices, no changes are reported this week.

The newsprint market continues moderately active, with consumption approximately 30 per cent below the peak level of last year.

Demand for sulphite bond papers continues at a moderate level and about the same condition is reported in some grades of ground wood papers. A better tone is reported to exist in tissue papers, with a small increase in sales volume for the current week. Kraft papers are maintaining the small, steady gains made during the past few weeks.

Sales volume of paper board continues about on the same level as last week. A reduction in prices of news, chip, single manila light chip and in kraft liners is reported for this week.

Chemical Pulp

An improved demand for chemical pulp of approximately two per cent is reported this week in some grades. Prices for many grades have been reduced during the week. The general tone of this market is somewhat better but consumption continues at a relatively low level and the trend in demand and prices is uncertain.

Mechanical Pulp

The demand for mechanical pulp is light. No change in demand or prices are reported for the current week.

Old Rope and Bagging

Demand for all grades of old rope continues very limited. Prices are unchanged at prevailing quotations. The demand for old bagging is light and quotations are unchanged at former prices.

Rags

The demand for new and old domestic rags is light. No change in prices is reported this week, though the improved demand for roofing rags which began two weeks ago, with a rise in prices last week, continues. The foreign rag market is inactive. Prices are nominal.

Waste Paper

The demand for all grades of waste paper continues very light. No change in prices are reported and no indication of an uptrend in demand is expected in the trade in the near future.

Twine

The twine market is rather quiet in all grades of soft and hard fiber twines. No change in prices is reported for this week and the trend of the market continues uncertain.

Produces New Type Belt Cover

Answering the demand for a new type conveyor belt cover capable of carrying varied kinds of packaged material at a greater degree of incline than is normally used in regular conveyor work, New York Belting and Packing Company has produced and placed in its regular line the N.Y.B.&P. Crepe Finish Package Conveyor Belt.

This belt, developed after careful study and experimentation to determine the type of surface providing the greatest degree of efficiency for varying incline service requirements, has a crepe surface of remarkable holding qualities.

The belt is finished with a special tan color crepe cover on the carrying side, which is tough and resilient, as well as attractive in appearance. While it provides the necessary roughness, its design is such that it is easily cleaned, thus enabling the full effect of its irregular surface to be utilized.

The N.Y.B.&P. crepe finish package conveyor belt is furnished in 28 oz. and 32 oz. duck, with the special crepe cover on the carrying side. Minimum thickness of the top cover is 1/16 inch. This may be increased as required. Additional back cover thickness will also be furnished as ordered.

Velocity Stage Turbines

Small steam turbines for driving auxiliary machinery, such as generators, pumps, fans, etc., are described in Catalog C issued by the De Laval Steam Turbine Company, Trenton, N. J. These turbines are of the velocity stage type and, when operated at suitable speeds, as in connection with high speed machinery or by the use of speed reducing gears, and exhausting to back pressure, show good efficiency. The design has been specially adapted to the use of high pressure, high temperature steam by locating the steam chest in the upper part of the casing cover, where it is above and well removed from the bearings.

J. Andersen & Co.

Selling Agents

21 East 40th Street

New York

CHEMICAL & MECHANICAL PULP

Kraft Pulp

BERGVIK OCH ALA NYA AKTIEBOLAG
Söderhamn, Sweden
KALIX TRÄINDUSTRI AKTIEBOLAG
Vanaffärden, Sweden
MUNKSUNDS AKTIEBOLAG
Munksund, Sweden
NENSJÖ CELLULOSA A.-B.
Sprängsvikon, Sweden

Unbleached Sulphite

AKTIESELSKABET GREAKER CELLULOSEFABRIK
Greaker, Norway
BERGVIK OCH ALA NYA AKTIEBOLAG
Söderhamn, Sweden
CELLULOSEFABRIKS A.-G.
Bratislava, Czecho-Slovakei
SVANÖ AKTIEBOLAG
Svanö, Sweden

Bleached Sulphite

KELLNER-PARTINGTON PAPER PULP CO., LTD.
Sarpsborg, Norway
Edsvalla, Sweden
Hallein & Villach, Austria

West Virginia Pulp and Paper Company

230 Park Ave.
New York

35 East Wacker Drive
Chicago

503 Market St., San Francisco, Cal.
Public Ledger Building, Philadelphia, Pa.

Manufacturers of

ENGLISH FINISH SUPERCALENDERED MACHINE FINISHED BOOK and LITHOGRAPHIC PAPERS

Offset, Envelope, Bond, Writing, Mimeograph, Ledger, Eggshell, Cover and Music Papers, Index Bristol, Post Card and Label Papers

HIGH GRADE COATED BOOK

. . . .

KRAFT WRAPPING AND KRAFT ENVELOPE.
KRAFT CYLINDER BOARD.
BLEACHED SULPHITE AND SODA PULP.
BLEACHED AND UNBLEACHED KRAFT PULP.

MILLS:

Mechanicsville, New York
Luke, Maryland
Covington, Virginia
Tyrone, Pennsylvania
Williamsburg, Pennsylvania
Cass, West Virginia
Charleston, South Carolina.

Knox felts

EXCELSIOR Knox Woolen Co. Camden, Me. FELTS & JACKETS

HIGH POROSITY

. . as a characteristic of a paper maker's felt will, not only add to the life of felt, but saves time lost on the machine due to excessive shut downs for washing. Specify

EXCELSIOR FELTS

and minimize this trouble. Made by the Knox Woolen Co., of Camden, Maine, since 1864.

BULKLEY, DUNTON & CO.

295 Madison Ave. New York, N. Y.

CAledonia-5 5260-68

ENGLISH ECCO CLAYS CLAYS

ECCO CLAYS TRADE MARK

UNIFORM • SUPERIOR • DEPENDABLE

English China Clays Sales Corporation
551 Fifth Avenue, New York City

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday May 25, 1938.

BLANC FIXE—The prices of blanc fixe continue steady and conform to prevailing quotations. The pulp is offered at from $42.50 to $45 per ton, in bulk; the powder is quoted at from 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER—The price of bleaching powder is unchanged at prevailing quotations. Bleaching powder is quoted at from $2 to $2.25 per 100 pounds, in drums, at works.

CASEIN—The demand for casein continues fair. Prices are slightly higher for the current week. Domestic standard ground casein is offered at from 7 to 8 cents per pound; domestic finely ground at from 8 to 9 cents per pound; all prices in bags, car lot quantities.

CAUSTIC SODA—Prices of caustic soda continue steady and conform to prevailing quotations. Solid caustic soda is quoted at from $2.10 to $2.30 per 100 pounds; flake and ground at from $2.50 to $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—The prices of china clay are reported as firm and unchanged at prevailing quotations. Imported clay is quoted at from $14.50 to $25 per ton, ship side. Domestic filler clay is offered at from $6.50 to $12 per ton; coating clay at from $11 to $22 per ton, at mines.

CHLORINE—The price of chlorine continues unchanged. Chlorine is quoted at 2.15 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—The demand for rosin is reported as fair. Prices are slightly higher for the current week. "G" gum rosin is quoted at $4.47; wood rosin at $4.25 per 280 pounds, gross weight, in barrels, at Savannah. Seventy per cent gum rosin size is quoted at $2.59 per 100 pounds, f.o.b., shipping point.

SALT CAKE—Prices of salt cake continue steady at prevailing quotations. Prices range at from $12 to $13.50 per ton; chrome salt cake at from $11 to $12 per ton, f.o.b., shipping point. Imported salt cake is quoted at from $14.50 to $15 per ton, Gulf or Atlantic Seaboard, on dock.

SODA ASH—The prices of soda ash are steady and conform to prevailing quotations. Prices of soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $.90; in bags, $1.05, and in barrels, $1.35.

STARCH—The corn starch market is reported as firm. Prices are slightly higher for the current week. Globe pearl is quoted at $2.65 per 100 pounds, in bags, and at $2.90 in barrels. Special paper starch is quoted at $2.75 per 100 pounds, in bags, and at $3.00 in barrels. All prices in car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina continue steady at prevailing prices. The commercial grades are offered at from $1.25 to $1.60 per 100 pounds; iron free at from $2 to $2.25 per 100 pounds, in barrels, at works.

SULPHUR—The sulphur market reports prices as firm and unchanged at prevailing quotations. Annual contracts are quoted at $18 per long ton, f.o.b., cars at mines. Spot and nearby car lots are offered at $21 per ton.

TALC—The prices of talc continue unchanged at prevailing quotations. Domestic talc is quoted at from $15 to $18 per ton, Eastern mines. Imported talc is offered at from $25 to $40 per ton, on dock.

Market Quotations

Paper

(Delivered New York)

News, per ton—
Roll, contract.....$50.00 @ —
Sheets .....58.00 @ —

Kraft—per cwt.—Delivered Zone A

No. 1 Northern....$5.12½ @$5.37½
Superstandard .... 5.00 @ —
Northern Standard Wrapping ..... 4.50 @ —
Standard Wrapping 4.00 @ —

Tissues—Per Ream—Carlots

White No. 1..... .92½ @ —
White No. 1 M. G. .90 @ —
White No. 1½.... .67½ @ —
White No. 2..... .60 @ —
Anti-Tarnish M. G. .75 @ —
Colored ..... .87½ @ —
Kraft ..... .75 @ —
Manila ..... .60 @ —
Unbl. Toilet, 1 M.. 3.20 @ —
Bleached Toilet.... 5.26 @ —

Paper Towels—

Unbleached ..... 1.80 @ —
Bleached ..... 2.10 @ —

Manila—per cwt.—C. l. f. a.

No. 1 Jute.....$8.25 @$10.25
No. 2 Jute..... 7.50 @ 9.50
No. 1 Wood..... 4.00 @ 5.25
No. 2 Wood..... 3.50 @ 4.00

Boards, per ton—

News .....$27.50 @$30.00
Chip ..... 27.50 @ 30.00
Sgl. Mla. Ll. Chip. 42.50 @ 45.00
Jute Lined Chip... 45.00 @ —
White Pat. Coated. 57.50 @ —
Kraft Liners..... 52.50 @ —
Binders Boards.... 75.00 @ 80.00

The following are representative of distributors' resale prices:—

Rag Content Bonds and Ledgers—
White, Assorted Items,
Delivered in Zone 1:

	Bonds	Ledgers
100% Rag Ext. No. 1	$41.40@$48.50	$42.55@$50.00
100% Rag	32.80@ 38.50	33.95@ 39.75
85% Rag	31.65	@37.25
75% Rag	24.75@ 29.00	25.90@ 30.50
65% Rag	21.65@ 26.25	22.80@ 27.75
50% Rag	18.70@ 22.75	19.90@ 24.25
25% Rag	15.80@ 19.25	16.95@ 20.75

Regular Colors @ $1.50 cwt. extra.
Heavy Colors @ $3.00 cwt. extra

Sulphite Bonds and Ledgers—
White, Assorted Items,
Delivered in Zone 1:

	Bonds	Ledgers
No. 1	$8.80@$10.75	$9.95@$12.00
No. 2	7.90@ 9.50	9.05@ 11.00
No. 4	7.00@ 8.50	8.20@ 10.00

Colors $1.00 cwt. extra.

Free Sheet Book Papers—
White, Cased Paper,
Delivered in Zone 1:

No. 1 Glossy Coated	$12.15@$14.25
No. 2 Glossy Coated	10.55@ 12.25
No. 3 Glossy Coated	9.35@ 11.00
No. 4 Glossy Coated	8.80@ 10.50
No. 1 Antique (watermarked)	8.80@ 10.50
No. 2 Offset	8.05@ 9.50
A Grade E. F.	7.90@ 9.50
A Grade S. & S. C.	8.15@ 9.75
B Grade E. F.	7.30@ 8.75
B Grade S. & S. C.	7.55@ 9.00
C Grade E. F.	7.00@ 8.50
C Grade S. & S. C.	7.25@ 8.75
D Grade E. F.	6.75@ 8.25
D Grade S. & S. C.	7.00@ 8.50

Ivory & India at $.50 cwt. extra.

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—
Moist .....27.00 @30.00
Dry .....27.00 @30.00

(Delivered)

No. 1 Domestic and Canadian .....29.00 @33.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—
Prime Bleached Sulphite ..... 2.50 @ 3.50
Prime Qualities—
Easy-Bleaching Sulphite ..... 2.25 @ 2.50
Strong Unbleached Sulphite ..... 2.00 @ 2.25

(On Dock, Atlantic Ports)

Kraft Bleached..... 2.75 @ 3.25
Kraft Light & Strong 2.00 @ 2.25
Kraft No. 1..... 1.85 @ 2.15
Kraft No. 2..... 1.75 @ 1.90

(F.o.b. Pulp Mill)

Kraft Domestic..... 2.00 @ 2.35

(Delivered)

Soda Bleached..... 2.90 @ —

Add 60 cents per short ton, dock charges for Albany; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—
New White, No. 1. 6.25 @ 6.50
Silesias No. 1..... 5.00 @ 5.25
New Unbleached.. 6.25 @ 6.50
Blue Overall..... 4.00 @ 4.50
Fancy ..... 2.25 @ 2.50
Washables ..... 1.80 @ 1.90
Mixed Khaki Cuttings ..... 3.60 @ 3.75
O. D. Khaki Cuttings 4.35 @ 4.50

Old Rags

White, No. 1—
Repacked ..... 3.40 @ 3.50
Miscellaneous ..... 2.75 @ 3.00
White, No. 2—
Repacked ..... 2.10 @ 2.25
Miscellaneous ..... 1.70 @ 1.80
Thirds and Blues—
Repacked ..... 1.40 @ 1.50
Miscellaneous ..... 1.25 @ 1.30
Roofing Rags
No. 1..... 1.00 @ 1.15
No. 2..... .75 @ .80
No. 3 (bagging)... .65 @ .70
No. 4..... .65 @ .70
No. 5A..... .65 @ .70

Foreign Rags

New Rags

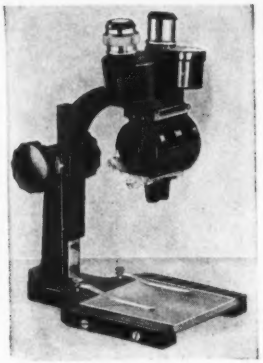
New Dark Cuttings.. 2.25 @ 2.40
New Mixed Cuttings. 2.00 @ 2.25
New Light Silesias.. 5.50 @ 5.75
Light Flannelettes... 5.50 @ 5.75
New White Cuttings. 7.00 @ 7.50
New Light Oxford.. 4.00 @ 4.50
New Light Prints... 3.00 @ 3.25

Old Rags

No. 1 White Linens. 7.50 @ 8.00
No. 2 White Linens. 6.50 @ 7.00
No. 3 White Linens. 4.50 @ 5.0

You need

STEREOSCOPIC MAGNIFICATION TO DETERMINE SURFACE CHARACTERISTICS



The B & L Wide Field Binocular Microscope AKW is an invaluable general purpose instrument in the laboratory of the paper technologist. Showing an erect and unreversed image in *three dimensions* it reveals surface characteristics, magnified 7X to 150X, just as the eyes would see them. It is also widely used for identification of fibers and dirt spots, for dissection, and for determinations of erasibility and ink absorption qualities. The range of magnifications include those suitable for TAPPI official methods. Patented revolving drum nosepiece permits rapid change of magnification without necessity of refocusing. Write today for full information to Bausch & Lomb Optical Co., 627 St. Paul St., Rochester, N. Y.

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TOGETHER, these features increase pulp output, shorten and standardize the cooking cycle, unify bleaching quality, reduce the heat required per cook, keep the cooking liquor at high strength, permit fixed and faster production schedule, reduce the amount of chemicals required, improve fuel economy by sending the pure condensed steam and its contained heat back to the boilers, and help the mill to increase its annual output with greater profit.

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All kinds and styles of Felts for all kinds and styles of Papers.

Write us about your Felt problems and let us help you reduce your Felt Costs—we will call anywhere at any time.

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Woolen manufacturers since 1856

No. 4 White Linens.	2.25	@	3.25
No. 1 White Cotton.	4.25	@	4.75
No. 2 White Cotton.	3.25	@	3.75
No. 3 White Cotton.	2.50	@	3.00
No. 4 White Cotton.	1.90	@	2.20
Extra Light Prints..	2.00	@	2.40
Ord. Light Prints...	1.75	@	2.15
Med. Light Prints...	1.55	@	1.95
Dutch Blue Cottons..	2.25	@	2.50
French Blue Linens..	3.00	@	—
Checks and Blues...	2.00	@	—
Linsey Garments....	1.90	@	2.00
Dark Cottons.....	1.50	@	1.60
Old Shopperies.....	1.30	@	1.45
New Shopperies.....	1.45	@	1.50
French Blues.....	2.25	@	2.50

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—			
Foreign	2.25	@	2.35
Domestic	2.20	@	2.25
Wool Tares, light....	1.50	@	1.75
Wool Tares, heavy..	2.00	@	2.10
Bright Bagging.....	1.60	@	1.70
Manila Rope—			
Foreign	3.00	@	3.25
Domestic	2.75	@	3.00
Jute Threads.....	2.75	@	3.00
Sisal Strings.....	1.75	@	2.00
Mixed Strings.....	.60	@	.70

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	2.25	@	2.35
Ordinary Hard White No. 1....	1.90	@	2.00
Soft White No. 1..	1.80	@	2.20
Flat Stock—			
Stitchless	.70	@	.80
Overissue Mag.....	.60	@	.70
Solid Flat Book...	.55	@	.60
Crumbled No. 1...	.40	@	.45
Ledger Stock.....	.90	@	.95
New B. B. Chips....	.15	@	.20
Manila—			
New Env. Cut....	1.85	@	2.00
New Cuttings.....	1.50	@	1.60
Old Kraft Machine—			
Compressed bales..	.70	@	.80
News—			
No. 1 White News	1.25	@	1.30
Strictly Overissue.	.45	@	.50
Strictly Folded....	.20	@	.25
No. 1 Mixed Paper..	.05	@	.10

Twines

(F. o. b. Mill)

(Soft Fiber)			
Coarse Polished—			
India	.11	@	.13
White Hemp.....	.12	@	.14
Fine Polished—			
Fine India.....	.15	@	.17
Unpolished—			
Box	.08½	@	—
Paper Makers.....	.07½	@	.08½
Tube Rope.....	.09	@	.10
Wall Paper.....	.10	@	.11
Wrapping	.11	@	.13
Soft Fiber Rope...	.09½	@	.11½
Cotton	.15	@	.20
(Hard Fiber)			
Medium Java.....	.09	@	.10
Mex. Sisal.....	.08½	@	.09½
Manila	.18	@	.25
Domestic	2.25	@	2.50
Sisal Rope.....	1.65	@	1.75
Mixed Rope.....	.50	@	.55
Transmission Rope...	1.50	@	1.75
Soft Jute Ropes.....	1.90	@	2.00
Jute Carpet Threads.	1.00	@	1.50
Gunny Bagging—			
Foreign	2.35	@	2.35
Domestic	1.85	@	1.95
Bleachery Burlap....	3.25	@	3.75
Scrap Burlap—			
Foreign	1.65	@	1.80
Domestic	—	@	1.90
Scrap Sisal	1.25	@	1.50
Scrap Sisal for Shredding	1.75	@	1.90
Wool Tares, Heavy..	1.60	@	1.70
New Burlap Cuttings	1.85	@	2.00
Aust. Wool Pouches.	2.85	@	3.10
Heavy baling bagging	1.85	@	2.00
Paper Mill Bagging..	1.00	@	1.15
No. 2 Bagging.....	.50	@	.60

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints.	.03	@	.03¼
New White No. 1...	.06½	@	.06¾
New White No. 2.	.05	@	.05½
New light flannelettes	.04½	@	.05
Silesias No. 1.....	.04½	@	.05
New Black Silesias..	.03¾	@	.04
Silesias No. 1			
Soft Unbleached.....	.06½	@	.06¾
Blue Cheviots.....	.05	@	.05½
Fancy	.03	@	.03¼
Washable	.02¾	@	.03

Cottons—According to grades—			
Blue Overalls.....	.04¾	@	.05
New Black, soft...	.03¾	@	.04
Khaki Cuttings....	.03¼	@	.03¾
O. D. Khaki.....	.04	@	.04½
Corduroy	.02¾	@	.03
New Canvas.....	.07¼	@	.07½
B.V.D. Cuttings.....	—	@	.06½

Domestic Rags (Old)

(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	—	@	2.75
Miscellaneous	2.50	@	2.75
White No. 2—			
Repacked	1.90	@	2.00
Miscellaneous	2.00	@	2.25
Twos and Blues.....	1.75	@	2.00
Third and Blues—			
Repacked	1.37½	@	1.75
Miscellaneous	1.25	@	1.62½
Black Stockings.....	3.90	@	4.00
Roofing Stock—			
No. 1.....	1.00	@	1.10
No. 2.....	.75	@	.85
No. 3.....	.65	@	.70

Foreign Rags

(F. o. b. Boston)

Dark Cottons.....	1.00	@	1.15
Dutch Blues.....	2.75	@	2.90
New Checks and Blues	2.85	@	3.00
Old Fustians.....	2.50	@	2.60
Old Linsey garments.	1.75	@	1.90
New Silesias.....	6.00	@	6.50

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1.	.05½	@	.06
New White, No. 2.	.03½	@	.04
Light Silesias.....	.04½	@	.05
Silesias, No. 1....	—	@	.04½
Black Silesias, soft.	.03	@	.03½
New Unbleached..	—	@	.06
Washable, No. 1..	.01¼	@	.01½
Blue Overall.....	.04	@	.04½
Cottons—According to grades—			
Washable No. 2...	.01	@	.01¼
New Blue.....	.01	@	.01¼
Fancy Percales....	—	@	.02½
New Black Soft...	.03	@	.03½
New Light Seconds	—	@	.04½
New Dark Seconds	.50	@	.75
Khaki Cuttings—			
No. 1 O. D.....	.03½	@	.04
No. 2 Mixed.....	.02	@	.02½
Corduroy	—	@	.02
New Canvas.....	.05	@	.05½
New Black Mixed.	.02½	@	.02¾

Domestic Rags (Old)

White No. 1—			
Repacked	2.50	@	3.00
Miscellaneous	2.25	@	2.50
Thirds and Blues—			
Miscellaneous	1.00	@	1.25
Repacked	1.00	@	1.25
Black Stockings (Export)	3.00	@	3.50
Roofing Stock—			
Foreign No. 1....	—	@	.75
Domestic No. 1...	—	@	.75
Domestic No. 2...	.50	@	.65
Roofing Bagging..	.80	@	.90

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.50	@	1.75
Domestic	1.50	@	1.75
Manila Rope.....	3.00	@	3.25
Sisal Rope.....	1.75	@	2.00
Mixed Rope.....	.75	@	1.00
Scrap—			
No. 1.....	—	@	1.25
No. 2.....	1.00	@	1.25
Wool Tares, heavy..	3.25	@	3.50
Mixed Strings.....	1.00	@	1.10
No. 1 New Light Burlap	3.00	@	3.50
New Burlap Cuttings	1.75	@	2.00

Old Papers

(F. o. b. Phila.)

Shavings—			
No. 1 Hard White.	2.35	@	2.40
No. 2 Hard White.	2.00	@	2.10
No. 1 Soft White..	2.00	@	2.10
No. 2 Soft White..	1.40	@	1.50
No. 1 Mixed.....	.70	@	.75
Solid Ledger Stock..	1.50	@	1.60
Ledger Stock, white.	1.25	@	1.30
Ledger Stock, colored	.85	@	.90
No. 1 Books, heavy..	.85	@	.90
Manila Cuttings.....	1.50	@	1.75
Print Manila.....	.45	@	.50
Container Manila....	—	@	.40
Kraft Paper.....	.90	@	.95
No. 1 Mixed Paper..	.25	@	.30
Straw Board Chip...	.25	@	.30
Binders Board Chip.	.25	@	.30
Corrugated Board...	.50	@	.55
Overissue News.....	.55	@	.60
Old Newspapers	.30	@	.35
No. 1 Old Manila...	.95	@	1.00
White Blank News..	1.30	@	1.40
No. 1 Kraft.....	.90	@	—
Mixed Papers.....	—	@	.10
Print Manila.....	.45	@	.50
Container Manilas...	.27½	@	—
Old Newspapers.....	.25	@	.32½
Paper Wool Strings..	.70	@	—
Overissue News.....	.45	@	.50
Box Board Chips....	.20	@	.25
Corrugated Boxes....	.27½	@	.30
Kraft corrugated boxes	.65	@	.75
Screenings wrappers.	.45	@	.50

BOSTON

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White.	2.25	@	2.40
No. 1 Soft White..	1.85	@	2.15
No. 2 Mixed.....	.75	@	.80
Solid Ledger Books..	1.50	@	1.75
Overissue Ledger Stock	1.30	@	1.50
Mixed Ledgers.....	.85	@	.90
No. 1 Books, heavy..	.65	@	.75
No. 1 Books, light...	.65	@	.75
Crumpled Stitchless Book Stock.....	.55	@	.65
Manila Env. Cuttings	1.60	@	1.70
Manila Envelope Cuttings, extra quality	2.00	@	2.10

Bagging

(F. o. b. Boston)

Manila Rope—			
Foreign	2.50	@	2.75

CHICAGO

Old Papers

(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope Cuttings....	1.80	@	1.90
No. 1 Hard White.	1.70	@	1.80
No. 1 Soft White..	1.50	@	—
Ledger & Writings..	.75	@	.80
Solid Books.....	.55	@	—
Blanks	.90	@	—
Krafts	.60	@	—
New Kraft Cuts.....	1.10	@	—
Manila Env. Cuts...	Nominal		
Ex. No. 1 Manila...	Nominal		
Print Manila.....	Nominal		
Overissue News.....	.35	@	—
Old Newspapers—			
No. 1 Folded News	.30	@	—
No. 1 Mixed Paper	.20	@	—
Roofing Stocks—			
No. 1.....	2.00	@	2.10
No. 2.....	1.85	@	2.00

TORONTO

Paper

Bonds and Ledgers

Delivered

No. 1 White	.36½	@	—
No. 1 Tints	.37½	@	—
No. 2 White	.26½	@	—
No. 2 Tints	.27½	@	—
No. 4 White	—	@	.1550
No. 4 Tints	.16.50	@	—
No. 5 Bond—White	11.85	@	—
No. 5 Bond—Tints	.12.85	@	—
No. 5 Bond—Golden Rod	.13.35	@	—
No. 5 Ledger—White	.1185	@	—
No. 5 Ledger—Tints.	.1285	@	—
No. 6 Bond—White	.10.75	@	—
No. 6 Bond—Tints	.11.25	@	—
No. 6 Bond—Golden Rod	.12.75	@	—
No. 7 Bond—White	9.10	@	—
No. 7 Bond—Tints	9.60	@	—
No. 7 Bond—Golden Rod	.11.10	@	—
Book—			
No. 1 M. F.	7.35	@	—
No. 2 M. F.	6.85	@	—
No. 3 M. F.	5.60	@	—
No. 1 S. C.	7.60	@	—
No. 2 S. C.	7.10	@	—
No. 3 S. C.	6.10	@	6.35
No. 1 Coated Book and Litho	12.50	@	—
No. 2 Coated Book and Litho	11.00	@	—
No. 3 Coated Book and Litho	10.00	@	—
Coated tinted	13.50	@	—
Wrapping—delivered—			
Rag Brown	4.85	@	5.55
White Wrap	4.00	@	—
"B" Manila	4.90	@	6.25
No. 1 Manila	5.50	@	7.00
Fiber	5.50	@	—
Kraft, No. 2	5.50	@	—

(F. o. b. Cars, Toronto)

News, per ton—			
Rolls (contract)	$50.00	@	—
Sheets	69.50	@	—

Pulp

Ground wood	29.50	@	—
Unbleached Sulphite	54.00	@	—
Book (Class 1)	64.00	@	—
Writing (Class 2)	62.00	@	—
Select (Class 3)	63.00	@	—
Kraft	50.00	@	—
Soda	56.00	@	—

Old Waste Paper

(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut...	2.25	@	—
Soft White.....	2.15	@	—
White Blk. News..	1.25	@	—
Book and Ledger—			
Flat Magazine and Book Stock (old)	.80	@	—
Light and Crumpled Book Stock.	.75	@	—
Ledgers and Writings	1.10	@	—
Manilas—			
New Manila Cut...	1.35	@	—
Printed Manilas...	.45	@	—
Kraft	.95	@	—
News and Scrap—			
Strictly Overissue.	.50	@	—
Strictly Folded....	.45	@	—
No. 1 Mixed Paper..	.30	@	—

Domestic Rags

(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.06½	@	.06¾
Fancy Shirt Cuttings	.02¼	@	.02½

CHEMIPULP PROCESS INC.

CHEMICAL PULP MILL ENGINEERS

Chemical Pulping Processes ☆ Operating Surveys
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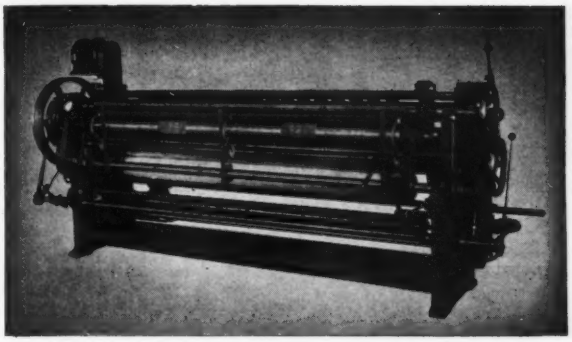

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Manufacturers of paper converting machinery for all purposes.

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Tell us your needs and we'll send complete information and blue prints of Kalamazoo Vitrified Glazed Tile for Jordan Chests, beater storage chests, beater dump chests, Fletcher-Bleachers, and stock chests. Also Wood Tanks, Acid Tanks, and Blow Pits.

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Special Types to Meet Unusual Requirements

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Manufacturers of

WEIGHT REGULATORS
CONSISTENCY REGULATORS
PROPORTIONING AND METERING SYSTEMS
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"SITUATIONS WANTED" ADVERTISEMENTS—4c a word, double rates for heavy face type. Minimum charge $1.00. If repeated ½ rate will be charged for each consecutive repetition.

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All classified "Help Wanted" and "Situation Wanted" advertisements are payable in advance.

HELP WANTED

SALARIED POSITIONS. $2,500 to $25,000. This thoroughly organized advertising service of 28 years' recognized standing and reputation carries on preliminary negotiations for positions of the calibre indicated, through a procedure individualized to each client's personal requirements. Several weeks are required to negotiate and each individual must finance the moderate cost of his own campaign. Retaining fee protected by a refund provision as stipulated in our agreement. Identity is covered and, if employed, present position protected. If you have actually earned over $2,500, send only name and address for details. R. W. Bixby, Inc., 117 Delward Bldg., Buffalo, N. Y.

WANTED—SUPERINTENDENT to run small board mill. Good opportunity for right man. Located 100 miles from Chicago. Apply only by letter stating full particulars, to Chicago Office. Rockton Felt & Paper Co., 860 W. Evergreen Ave., Chicago, Ill. tf

WANTED—Experienced paper mill plant engineer capable of handling men and assuming complete responsibility in a two machine paper mill. Give full details in first letter and wages expected. Address Box 38-175, care Paper Trade Journal. M-26

FINISHING FOREMAN WANTED—Experienced in large book paper mill. Apply giving age, education, experience, salary. Also enclose small photo if convenient. Address Box 38-180, care Paper Trade Journal. J-2

WANTED MACHINE TENDER for six cylinder board machine running on folding and set-up boxboards. Must be sober and steady. Give age and references in first letter. Address Box 38-198, care Paper Trade Journal. J-2

WANTED FIRST CLASS BACKTENDER experienced on book papers. Steady work. Advise experience and detail. Address Box 38-194, care Paper Trade Journal. J-2

WANTED—SALES REPRESENTATIVE for contacting Southern paper and board manufacturers, having technical education and practical experience in the manufacture of paper. Age preferably between 30 and 35 years. Give detail experience and references. Address Box 38-195, care Paper Trade Journal. J-9

SITUATIONS WANTED

PAPER MAKER desires position as superintendent or assistant. Night or tour boss. Would consider running with advancement. Any type machine all grades of paper. Address Box 38-128, care Paper Trade Journal. J-9

CARDBOARD CONVERTER—Executive, employed, wants change. Opportunity essential. Broad experience in all phases of business and in wide variety of products—standard lines and specialties. Address Box 38-93, care Paper Trade Journal. M-26

SITUATIONS WANTED

MR. PAPER MANUFACTURER

Are the Merchants selling your papers? Are they working WITH you? I know the majority of the better class personally, know their needs, their actions, why they do this—and that, and how to get them to push your lines. Also where the mills fall down in helping the Merchant, who awaits gladly such co-operation—that so rarely comes.

This is your opportunity to secure the services of a paper man who can build your sales on a sound and stable basis. Address Box 38-178, care Paper Trade Journal. J-2

MANUFACTURER'S AGENT—Virginia and South, wants accounts for paper mills. Address Box 38-183, care Paper Trade Journal. J-9

MAN—Fifty-one, with thirty years' purchasing and general office experience, desires position. Excellent record. Address Box 38-182, care Paper Trade Journal. J-9

PLANT ENGINEER and MASTER MECHANIC—Technically trained. Broad experience in design, manufacture and installation of paper mill machinery. Also experienced power plant engineer, good on maintenance, development work and plant layout. Good at organization and managing engineering department of large paper mill. Skilled at reducing conversion costs through good engineering. Address Box 38-28, care Paper Trade Journal. J-9

COLORMAN AND BEATERROOM FOREMAN wishes position. Familiar with Kraft, Sulphite and Specialty papers. Address Box 38-159, care Paper Trade Journal. J-16

PAPER MAKER desires position as beater room foreman, assistant superintendent or tour boss. Color expert. Kraft, sulphite, light and heavy weight papers. Address Box 38-160, care Paper Trade Journal. J-16

SUPERINTENDENT wishes position. Familiar with Kraft, Sulphite and specialty paper. Also glassine and greaseproof. Good on colors. Address Box 38-161, care Paper Trade Journal. J-16

BOSS BEATERMAN or Beater Engineer. 18 years' experience. 38 years of age. Experienced on Rags, Sulphite, Kraft Specialties. Expert colorman. Steady, sober worker. Address Box 38-123, care Paper Trade Journal. J-2

COATING MILL COLORMAN—Young man technical graduate. Experienced Foreman high grade coating mill. Tag, friction, book, covers, box-papers, desires new position. Address Box 38-170, care Paper Trade Journal. M-26

CHEMIST desires position. Experienced in bleaching and pulp testing; also familiar with laboratory routine. Capable of taking responsibility. Address Box 38-169, care Paper Trade Journal. M-26

Address Replies

to advertisements appearing under Box Numbers in care of

PAPER TRADE JOURNAL
15 West 47th Street
New York, N. Y.

SITUATIONS WANTED

AVAILABLE—Man, middle age, thirty years' wide experience, well known in trade for honesty and efficiency. Do buying in New York Market for Rag or Paper Mill Supply on percentage basis. An interview would be of mutual advantage. Address Box 38-179, care Paper Trade Journal. J-9

MERCHANDISING SPECIALIST—College man, forty, qualified direct all activities; mill or jobber representative. Well grounded all marketing and organization functions. Has successfully served various divisions paper industry; engineering; electrical and metal products fields. Would prove highly valuable to manufacturer of equipment or products for paper industry. Has nationwide close contacts including Governments. A man who can actually dispose of products manufactured for sale. Address Box 38-150, care Paper Trade Journal. M-26

PAPER MILL PLANT ENGINEER wants position. I have had a wide experience in paper mill and power house work. Address Walter Kelsey, 14 East 28th Street, New York, N. Y. J-2

TOUR BOSS or MACHINE TENDER—Experienced on all grades of Box Board and Test Liners. Can come at once. Best of references. Address Box 38-196, care Paper Trade Journal. J-2

FOR SALE

MOORE and White Four Drum Winder 130". First class condition, for sale cheap. Address Box 38-172, care Paper Trade Journal. J-2

FOR SALE—68" Oswego-Brown & Carver Auto Cutter, rebuilt and fully guaranteed. Address Box 38-199, care Paper Trade Journal. M-26

FOR SALE—Five 12 Bird Screens and three 12 plate Sandy Hill Packer Screens. Address Box 38-192, care Paper Trade Journal. M-26

PAPER COATING MACHINERY—Waxing, Oiling, Gumming, Gluing, Asphalt Duplexing Laboratory Coating and Treating machines. High speed. New improvement. MAYER COATING MACHINES COMPANY, INC., Rochester, N. Y. T.F.

FOR SALE

Harper Fourdrinier Machine, trims 72". Two presses. 19 dryers 36 x 76". Two calenders. Reel. Winder. Drive.
Experimental Fourdrinier Machine 48" wire.
Moore & White Fourdrinier part, suspension type takes a wire 80" x 50', with suction couch roll
Dryers: 40—36" x 84".
Ream Cutters: 3 Seybolds 50" to 54".
Hamblet Cutters: 48" to 90" single; 94" to 108". 36" duplex.
Approximately 1,000 calender and press rolls.

FRANK H. DAVIS COMPANY
175 Richdale Ave. Cambridge, Mass.

Look Through the Columns of the Clearing House for the equipment you need.

SHARTLE OFFERS:

USED EQUIPMENT

1—250# wood tub Niagara beater
3—66 x 60 Downingtown iron tub beaters

2—120" calendar stacks
1—150" calendar stack
1—44" ream cutter
1—48" ream cutter
1—65" Seybold ream cutter
1—72" Hamblet single cutter and layboy
1—82" Moore & White single cutter
1—96" Hamblet single cutter
1—99" Hamblet single cutter
1—101" Beloit duplex cutter
2—110" Beloit duplex cutters
1—116" Hamblet duplex cutter with backstand
1—120" Black-Clawson duplex cutter
4—New #10 Taylor Stiles rag cutters

1—8' x 98" Yankee dryer
1—10' x 132" Yankee dryer
1—12' x 132" Yankee dryer

1—12 x 14 engine direct connected to 125 volt generator
1—14 x 25 x 20 Ball engine
1—16 x 20 Brownell variable speed engine
1—24 x 42 Hamilton uniflow engine 525 HP
1—100 HP Terry steam turbine
1—100 HP semi Diesel engine
1—125 HP Westinghouse geared turbine

1—Appleton late type close coupled Jordan with 150 HP, Electric Machinery, 3 phase, 60 cycle, 440 volts, 360 RPM motor
1—#2 Emerson Jordan
1—#1 Miami Jordan
4—#2 Miami Jordans
4—#6 Miami Jordans
1—#6 Miami Jordan with anti-friction bearings, 200 HP, slip ring, 3 phase, 60 cycle, 2200 volts, 440 RPM motor
2—Noble & Wood Mammoth Jr. Jordans

1—10 x 20 duplex stuff pump
2—12 x 20 Shartle triplex stuff pumps
75 Centrifugal pumps

1—72" Rogers wet machine
1—84" Rogers wet machine
1—96" Rogers wet machine

1—14-9/16x93" Millspaugh suction press roll
1—18x112" suction press roll
2—14-9/16x114" suction press shells only
1—18x125" face of perforations suction press roll
1—18x136" suction press roll
1—18x142⅞" face of perforations Millspaugh suction press roll
750 Press rolls

1—14-9/16x74" Millspaugh suction couch roll
1—14-9/16x91" Millspaugh suction couch roll
1—14-9/16x116" face of perforations suction couch roll
1—18x125" Millspaugh suction couch roll
1—18x125" face of perforations Sandusky suction couch roll
1—22x128" face of perforations suction couch roll shell only
1—18x138" Millspaugh suction couch roll
1—22x138" face of perforations Millspaugh suction couch roll
1—18x138½" face of perforations suction couch roll
1—18x158" Millspaugh suction couch roll

(Note: Can cut down any of these rolls)

1—84"x84" Shartle breaker
4—84" chippers
1—16x42 new digester
2—#6 Reeves drives (almost new) with anti-friction bearings
5—Almost new Erkensators
1—Bird centrifiner
2—4 pocket grinders
2—Voith magazine grinders
3—Dilts hydrafiners with motors
1—12'x8' Oliver saveall
1—#4 Bird saveall
2—#5 Bird savealls
2—#2 Bird rotary screens, copper vats
25 pulp screens, Impco, etc.
200 valves—various sizes

1—3 cylinder machine, molds 30x48, rubber covered couchers
25 dryers
5 roll calender stack
Single cutter

1—3 cylinder machine
Molds 30x50
3 primary and two main presses
28 dryers 36x48
Calender stack, winder & cutter

1—3 cylinder machine
Molds 36x74
2 Main presses
27 dryers 48x68
2 calender stacks
Reel, slitter, winder & drive

1—6 cylinder board machine
Molds 36x82, C.I. vats
5 pr. primary presses
3 pr. main presses
89 dryers
2 calender stacks

1—3 cylinder machine
Molds 48x86 mounted in anti-friction bearings
1 suction press
2 conventional presses
18 dryers 36x80¾ mounted double deck
2—5 roll calenders
Reel and drive

1—5 cylinder board machine
Molds 36x108
2 pr. squeeze rolls
5 pr. primary presses
3 pr. main presses
62 dryers 36x104
2 stacks calenders
Reel, winder & slitter

1—fourdrinier machine
Wire 46'x85"
2 Main presses
1 smooth press
26 dryers 36x80
1 calender stack
1 Pusey & Jones reel

1—Beloit fourdrinier machine
Wire 120"x70'
1 suction press
1 conventional press
38 dryers 48x118" with Ross high pressure air system
1 ten roll calender stack
Reel and winder

1—Black-Clawson fourdrinier machine
Wire 124"x60'
2 conventional presses
19 dryers 48x120"
1 five roll calender stack
1 seven roll calender stack
Reel and winder

1—Black-Clawson fourdrinier machine
Wire 132"x65'
2 conventional presses
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1 lead dryer
1 nine roll calender stack
Reel, winder & slitters

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Testing Machines, Inc.

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COMBINING MACHINE
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CONTROLLERS, Moisture Content
The Foxboro Company

CONTROLLING INSTRUMENTS
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The Brown Instrument Co.
Cash Company, A. W.
The Foxboro Company
General Electric Co.
Leeds & Northrup Company
Testing Machines, Inc.

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Link Belt Co.

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CONVEYOR CHAINS
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CONVEYORS
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Murray, D. J. Mfg. Co.
Ross Engineering Corp., J. O.

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Chemipulp Process, Inc.
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Murray Mfg. Co., D. J.
Ross Engineering Corp., J. O.

COOLERS
Foster Wheeler Corporation
Ross, J. O. Mfg. Co.
Stebbins Engrg. & Mfg. Co.
Worthington Pump & Mchy. Corp.

COPPER WATER TUBE AND SWEAT FITTINGS
Chase Brass & Copper Co.

CORES (Paper)
Elixman Paper Co.
Sonoco Products Co.

CORES (Steel)
Rodney Hunt Machine Co.
Smith & Winchester Mfg. Co.

COUCH ROLLS
American Wringer Co.
Appleton Machine Co.
Beloit Iron Works
Black-Clawson Company
The Cincinnati Rubber Mfg. Co.
Downingtown Mfg. Co.
Emerson Mfg. Co.
Goodrich Rubber Co., B. F.
Moore & White Co., The
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Rodney Hunt Machine Co
Shartle Brothers Machine Co.
Montague Machine Co.
D. J. Murray Mfg. Co.
Stowe-Woodward, Inc.
Valley Iron Works

COUPLINGS
Allis Chalmers Mfg. Co.
Bagley & Sewall Mfg. Co.
Beloit Iron Works
Black-Clawson Company
De Laval Steam Turbine Co.
Farrel-Birmingham Co., Inc.
The Frederick Iron & Steel
E. D. Jones & Sons Co.
Link Belt Co.
Midwest-Fulton Machine Co.
Moore & White Co.
Shartle Brothers Machine Co.
Stebbins Engrg. & Mfg. Co.
Waldron Corp., John
Walworth Co.
Westinghouse Elec. & Mfg. Co.
T. B. Wood's Sons

CREPING MACHINES
Beloit Iron Works
Hudson Sharp Machine Co.
Paper Converting Machine
Shartle Brothers Machine Co.
John Waldron Corp.

CUTTERS
Beloit Iron Works
Black-Clawson Company
Cameron Machine Co.
Davis, Frank H., Co.
Downingtown Mfg. Co.
Emerson Mfg. Co.
Hamblet Machine Co.
Hudson Sharp Mch. Co.
Shartle Brothers Machine Co.

CYLINDER MACHINES
Beloit Iron Works
Black-Clawson Company
Davis, Frank H., Co.
Downingtown Mfg. Co.
Improved Paper Mchry. Co.
Moore & White Co.
Pusey & Jones Corp.
Shartle Brothers Machine Co.
Valley Iron Works

CYLINDER WIRES
Appleton Wire Works
International Nickel Co.
International Wire Works
Lindsay Wire Weaving Co.

DAMPENERS
Perkins & Son, Inc., B. F.
Valley Iron Works

DAMPER REGULATORS
Cash Company, A. W.
The Foxboro Company

DECKERS
Appleton Machine Co.
Bird Machine Company
Improved Paper Mchy. Corp.
Montague Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Oliver United Filters, Inc.
Shartle Brothers Machine Co.
Valley Iron Works

DECKLE STRAPS
Shartle Brothers Machine Co.
Stowe-Woodward, Inc.

DEFOAMERS
American Cyanamid & Chemical Corp.
National Oil Products Co.

DIE CUTTERS
Appleton Machine Co., The

DIGESTERS
Pusey & Jones Corp.
Stebbins Engrg. & Mfg. Co.

DIGESTER CONTROLS
The Foxboro Company

DIGESTER FITTINGS
The Cooper Alloy Foundry Co.
Duriron Company
Murray, D. J., Mfg. Co.

DIGESTER LININGS
Stebbins Engrg. & Mfg. Co.

DOCK CONSTRUCTION
Merritt-Chapman & Scott Corp.

DOCTORS
Beloit Iron Works
Bird Machine Company
Black-Clawson Company
Downingtown Mfg. Co.
Lobdell Carwheel Co.
Shartle Brothers Machine Co.
Valley Iron Works

DOCTOR BLADES
John W. Bolton & Sons, Inc.
The Cincinnati Rubber Mfg.
Goodrich Rubber Co., B. F.
Continental Diamond Fibre Co.
Emerson Manufacturing Co.
Improved Paper Mchy. Corp.
International Nickel Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Stowe-Woodward, Inc.
Westinghouse Electric & Mfg.

DOCTOR BLADES (Bronze For)
Black-Clawson Company
John W. Bolton & Sons, Inc.
Chase Brass & Copper Co.
Emerson Manufacturing Co.
Shartle Machine Co.

DRAINAGE SYSTEMS
Crane Company
Midwest-Fulton Machine Co.
Stickle Steam Specialties Co.

DREDGING
Merritt-Chapman & Scott Corp.

DRIERS
Allis Chalmers Mfg. Co.
Beloit Iron Works
Black-Clawson Company
Davis, Frank H., Co.
Link Belt Co.
Ross, J. O. Engineering Corp.
Shartle Brothers Machine Co.
Waldron, John, Corp.

DRIVES & DRIVE STANDS
Beloit Iron Works
Bird Machine Co.
Black-Clawson Company
Davis, Frank H., Co.
Downingtown Mfg. Co.
Farrel-Birmingham Co.
General Electric Co.
Link-Belt Co.
Moore & White Co.
Murray, D. J. Mfg. Co.
Pusey Jones Corp.
Shartle Brothers Machine Co.
Valley Iron Works
Westinghouse Electric & Mfg.
Worthington Pump & Mchy. Corp.

DRYER FELTS
Asten-Hill Mfg. Co.
Mt. Vernon-Woodbury Mills, Inc.
Turner Halsey & Co.
Shuler & Benninghofen

DRYER STEAM CIRCULATION
Midwest-Fulton Machine Co

DRYING SYSTEMS
Midwest-Fulton Machine Co.
Murray Mfg. Co., D. J.
Ross Engineering Corp., J. O
Stickle Steam Specialties
Waldron Corporation, The

DUAL PRESS (Horizontal)
Beloit Iron Works

DUSTERS
Appleton Machine Co.
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Midwest-Fulton Machine Co.
Moore & White Co
Norwood Eng. Co.
D. J. Murray Mfg. Co.

DYESTUFFS & COLORS
Ciba Company
E. I. du Pont de Nemours & Co.
Geigy Co., The
General Dyestuff Corp.
Heller & Merz
National Aniline & Chemical
N. Y. Color & Chemical Co.
Paper Makers Chemical Co
C. K. Williams & Co.

ELECTRIC EQUIPMENT
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Electric & Mfg Co.

ELEVATORS (Portable)
Link Belt Company
Revolvator Company

EMBOSSING MACHINES
Hudson Sharp Machine Co.
Paper Converting Machine Co
John Waldron Corp.

EMBOSSING ROLLS
The Appleton Machine Co.
Hudson Sharp Machine Co.
B. F. Perkins & Son, Inc.
Roehlen Engraving Works, Inc.
Waldron Corporation, John

ENGINEERING CONSTRUCTION
Merritt-Chapman & Scott Corp.

EVAPORATORS
Murray, D. J., Mfg. Co.
Swenson Evaporator Co.

EXTRACTORS
Bird Machine Company
Downingtown Manufacturing
E. D. Jones & Sons Co.
Midwest-Fulton Machine Co.
Valley Iron Works Co.

WHERE TO BUY

FANS
Duriron Company
General Electric Co.
B. F. Perkins & Son, Inc.
Ross Engineering Co., J. O.
Westinghouse Electric & Mfg. Co.

FAN CONTROLS (Ventilating)
The Bristol Company
Cash Company, A. W.
The Foxboro Company

FEEDERS
The Jeffrey Manufacturing Co.

FELT CARRIER ROLLS
American Wringer Co.
Appleton Machine Co.
Beloit Iron Works
Black-Clawson Company
The Cincinnati Rubber Mfg. Co.
Downingtown Mfg. Co.
Goodrich Rubber Co., B. F.
Rodney Hunt Machine Co.
Shartle Brothers Machine Co.
Stowe-Woodward, Inc.
Valley Iron Works

FELT CLEANERS
Magnus Chemical Co.
National Oil Products Co.
Philadelphia Quartz Co.

FELT CONDITIONERS
Bird Machine Company

FELTS
Appleton Woolen Mills
Asten-Hill Mfg. Co.
Bulkley Dunton Pulp Co., Inc.
Draper Bros. Co.
Huyck & Son, F. C.
Knox Woolen Co.
Lockport Felt Co.
Mt. Vernon-Woodberry Mills Inc.
Orr Felt & Blanket Co.
Shuler & Benninghofen
Turner Halsey & Co.
Waterbury Felt Co.
H. Waterbury & Sons Co.

FELT GUIDES
Beloit Iron Works
Moore & White Co.
Shartle Brothers Machine Co.
John Waldron Corp.

FELT TIGHTENER (Automatic)
John Waldron Corp.

FILTERS
Improved Paper Mchy Corp.
Moore & White Co.
Norwood Engrg. Co.
Oliver United Filters Inc.
J. O. Ross Engrg. Corp.
Stebbins Engrg. & Mfg. Co.
Swenson Evaporator Co.

FILTER CLEANERS
Magnus Chemical Co.

FILTER WIRES
Chase Brass & Copper Co.
International Nickel Co.

FITTINGS, Pipe (Plain end or flanged)
Chase Brass & Copper Co.
The Cooper Alloy Foundry Co.
Crane Co.
Duriron Company
Michigan Steel Castings Co.
Walworth Company

FLEXIBLE COUPLINGS
Beloit Iron Works
Black-Clawson Company
De Laval Steam Turbine Co.
Emerson Manufacturing Co.
Farrel Birmingham Co.
The Frederick Iron & Steel Co.
Link-Belt Co.
Midwest-Fulton Machine Co.
Shartle Brothers Machine Co.
John Waldron Corp.
T. B. Wood's Sons
Westinghouse Electric & Mfg. Co.

FLEXIBLE SLICE
E. D. Jones & Sons Co.

FLOORING
American Pressed Steel Co.
Goodrich, B. F. Rubber Co.
Hendrick Mfg. Co.
Norton Co.
Stebbins Engrg. & Mfg. Co.

FLOW METERS
Bristol Co., The
The Foxboro Company
Leeds & Northrup Company

FLY BARS
Black-Clawson Company
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
John W. Bolton & Sons, Inc.
Emerson Manufacturing Co.
Jones & Sons Co., E. D.
Midwest-Fulton Machine Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.

FOLDING ENDURANCE TESTERS
Testing Machines, Inc.

FOLDING MACHINES
Emerson Manufacturing Co.
Hamblet Machine Co.
Hudson Sharp Machine Co.
Norwood Eng. Co.
Paper Converting Machine Co., Inc.
Waldron, John, Corp.

FORMING MACHINES
Downingtown Mfg. Co
Shartle Brothers Machine Co.

FOURDRINIER MACHINES
Bagley & Sewall Mfg. Co.
Beloit Iron Works
Black-Clawson Company
Davis, Frank H., Co.
Downingtown Mfg. Co.
Moore & White Co.
Pusey & Jones
Shartle Brothers Machine Co.
Smith & Winchester

FOURDRINIER WIRES
Appleton Wire Works
International Wire Works
Lindsay Wire Weaving Co.
Purves Machine Wire Co.

FREENESS RECORDERS
Trimbley Machine Works

FREENESS TESTERS
Testing Machines, Inc.

FREQUENCY RECORDERS
The Bristol Company
Leeds & Northrup Company

FURNACE PRESSURE (Draft Control)
The Bristol Company
Cash Company, A. W.
The Foxboro Company
Leeds & Northrup Company

GALVANOMETERS
Foxboro Company
General Electric Co.
Leeds & Northrup Company
Westinghouse Elec. & Mfg. Co.

GAS ANALYSIS EQUIPMENT (SO_2 and CO_2 Recorders)
The Foxboro Company
Leeds & Northrup Company

GAS BURNER CONTROLS Automatic Systems)
Cash Company, A. W.

GATES (Canal)
Rodney Hunt Machine Co.

GATES (Sluice)
Rodney Hunt Machine Co.

GEARS
Beloit Iron Works
Black-Clawson Company
De Laval Steam Turbine Co.
Downingtown Mfg. Co.
Emerson Manufacturing Co.
Farrel-Birmingham Co.
Improved Paper Mchy. Corp.
E. D. Jones & Sons Co.
Link-Belt Co.
Midwest-Fulton Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works
John Waldron Corp.
Worthington Pump & Mchy. Corp.

GEARMOTORS
Midwest-Fulton Machine Co.
Westinghouse Electric & Mfg Co.

GENERATORS
Allis Chalmers Mfg. Co.
De Laval Steam Turbine Co.
General Electric Co
Westinghouse Elec. & Mfg. Co.
Worthington Pump & Mchy. Corp.

GENERAL CONTRACTORS
Merritt-Chapman & Scott Corp.

GRABS & GRAPPLES
J-B Engineering Sales Co.
Link Belt Company

GRANITE ROLLS
Beloit Iron Works
Black-Clawson Company
Downingtown Mfg. Co.
Perkins & Son, Inc., B. F.

GRINDERS
Covel-Hanchett Co.
Eppenbach, Inc.

GRATING (Sidewalk)
Hendrick Mfg. Co
Norton Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.

HAMMERS (Soft Faced)
Greene, Tweed & Co.

HAND CLEANERS
Magnus Chemical Co.

HANGERS
Crane Co.
Link Belt Co.
Walworth Co.
T. B. Wood's Sons Co.

HEAT EXCHANGERS
Duriron Company
Midwest-Fulton Machine Co.
Worthington Pump & Mchy. Corp.

HEATING AND VENTILATING SYSTEMS
Babcock & Wilcox Co.
Crane Co.
General Electric Co.
Grinnell Company
D. J. Murray Mfg. Co.
Ross Engineering Corp., J. O.
J. E. Singer
Stickle Steam Specialties Co.
Worthington Pump & Mchy. Corp.
Westinghouse Elec. & Mfg. Co.

HEAT-TREATING FURNACES
Leeds & Northrup Company

HIGH DENSITY THICKENERS
Shartle Brothers Machine Co.

HOISTS
Allis Chalmers Mfg. Co.
Appleton Machine Co.
General Electric Co.
Rodney Hunt Machine Co.
E. D. Jones & Sons Co
Link Belt Co.

HOSE (Air, Water, Suction, etc.)
The Cincinnati Rubber Mfg. Co.
Goodrich Rubber Co.
Goodyear Tire & Rubber Co.
Manhattan Rubber Mfg. Co.
U. S. Rubber Products Co.

HUMIDITY RECORDERS
The Bristol Company
The Foxboro Company
Leeds & Northrup Company

HYDRAULIC MACHINERY
Farrel-Birmingham Co.

INDICATORS
The Bristol Co.
The Foxboro Company
General Electric Co.
Grinnell Company
Leeds & Northrup Company

INTERFOLDING MACHINES
Hudson Sharp Machine Co.
Paper Converting Machine Co.
John Waldron Corp.

INSTRUMENTS
Bowsher, N. P.
The Bristol Co.
The Foxboro Company
General Electric Co.
Leeds & Northrup Company
Testing Machines, Inc.
Westinghouse Electric & Mfg. Co.

JORDANS
The Appleton Machine Co.
Emerson Manufacturing Co.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co
Smith & Winchester Mfg. Co.
Valley Iron Works

JORDAN FILLINGS
Appleton Machine Co.
John W. Bolton & Sons, Inc.
Davis, Frank H., Co.
Emerson Manufacturing Co.
International Nickel Co.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works

K MONEL
International Nickel Co.

KNIVES
Beloit Iron Works
John W. Bolton & Sons, Inc.
Dilts Machine Works, Inc.
Hamblet Machine Co.
E. D. Jones & Sons Co.
Valley Iron Works

LABELLING MACHINES
Potdevin Machine Co.

LABORATORY EQUIPMENT
Appleton Machine Co.
Dilts Machine Works
E. D. Jones & Sons Co.
Leeds & Northrup Company
Mine & Smelter Supply Co.
Noble & Wood Machine Co.
Testing Machines, Inc.
Valley Iron Works
Wilkens-Anderson Co.

LATHES
Montague Machine Co.

LAY BOYS
Hamblet Machine Co.
Moore & White Co.

LEVELERS
National Oil Products Co.

LIFTING PLATFORMS
Revolvator Company

LIQUID LEVEL RECORDERS
The Foxboro Company
Leeds & Northrup Company

LITHOPONE
Chemical & Pigment Co.
New Jersey Zinc Co.

LOAD (Electrical) Control
Leeds & Northrup Company

LOFT DRYERS
Ross Engineering Corp., J. O.
John Waldron Corp
Valley Iron Works

WHERE TO BUY

LUBRICANTS
Gulf Refining Co.
Standard Oil Co. of Indiana
Tide Water Associated Oil Co.

MACHINERY ERECTION
Merritt-Chapman & Scott Corp.

MAGNIFIERS (Pocket)
Bausch & Lomb Optical Co.

MARKING BANDS (Rubber)
The Cincinnati Rubber Mfg. Co.
Stowe-Woodward, Inc.

MEASURING INSTRUMENTS
The Bristol Company
The Foxboro Company
Leeds & Northrup Company
Wilkens-Anderson Co.

METERS
The Bristol Co.
The Foxboro Company
Leeds & Northrup Company
Westinghouse Electric & Mfg. Co.
Worthington Pump & Mchy. Corp.
Worthington-Gamon Meter Co.

METERING & PROPORTIONING SYSTEMS
The Bristol Company
The Foxboro Company
Trimbey Machine Works

MICROMETERS
Farrel-Birmingham Co.
Lobdell Car Wheel Co.
Montague Machine Co.
Testing Machines, Inc.

MICRO-PROJECTORS
Bausch & Lomb Optical Co.

MICROSCOPES
Bausch & Lomb Optical Co.

MIXERS
Eppenbach, Inc.
Link Belt Company
Waldron Corp., John

MONEL METAL (Covered Rolls)
The International Nickel Co.

MONEL METAL (Rolled Forms)
The International Nickel Co.

MOTORS
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Electric & Mfg. Co.

NAPKIN FOLDING MACHINE
Hudson Sharp Machine Co.
Paper Converting Machine Co., Inc.
Waldron, John, Corp.

NICKEL CHROMIUM STEEL
The Cooper Alloy Foundry Co.
Duriron Company

NICKEL-CLAD STEEL
The International Nickel Co.

NICKEL IRON ALLOYS
The Cooper Alloy Foundry Co.
Duriron Company
The International Nickel Co.

OPACIFYING PIGMENT
Chemical & Pigment Co.
New Jersey Zinc Co
Titanium Pigment Co.
R. T. Vanderbilt Co.

OSCILLATORS (Roll Winders)
Midwest-Fulton Machine Co.

PACKAGING MACHINES
Hudson Sharp Machine Co.

PACKING
Cincinnati Rubber Mfg. Co.
Goodrich, B. F. Rubber Co.
Manhattan Rubber Co.
Rhoads, J. E. Sons
Stebbins Engrg. & Mfg. Co.

PACKING BOXES
Shartle Brothers

PACKING (Specially Treated to Caustic Soda and Alkalies)
Greene, Tweed & Co.

PACKAGING (Rubber)
B. F. Goodrich Rubber Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.

PANZL STRAINERS
Duriron Company

PAPER BAG MACHINERY
H. H. Heinrich, Inc.
Potdevin Machine Co.
Smith & Winchester Mfg. Co.
Shartle Brothers Machine Co.
Strachan & Henshaw, Ltd.
Weber, Herman G.

PAPER CUTTERS
Black-Clawson Company
Davis, Frank H., Co.
Downingtown Mfg. Co.
Hamblet Machine Company
Moore & White Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.

PAPER MACHINE APRONS
Goodrich Rubber Co., B. F.

PAPER MACHINE DRIER CONTROL SYSTEMS
The Bristol Company
The Foxboro Company
Midwest-Fulton Machine Co.

PAPER MANUFACTURERS
West Virginia Pulp & Paper

PAPER MACHINE HOODS
Ross Engineering Corp., J. O.

PAPER MACHINE SLICES
Beloit Iron Works
Black-Clawson Company
E. D. Jones & Sons Co.
Montague Machine Co.

PAPER ROLLS
B. F. Perkins & Son, Inc.
Waldron Corp., John

PAPER SCALES
Testing Machines, Inc.

PAPER TESTERS
Perkins & Son, Inc., B. F.
Valley Iron Work
Testing Machines, Inc.

PAPER TUBE MACHINERY
Dietz Machine Works
Langston Co., Samuel M.

PAPER WAXING MACHINERY
Potdevin Machine Co.
Shartle Brothers Machine Co.
Strachan & Henshaw, Ltd.
Waldron Corp., John

PASTING MACHINES
Beloit Iron Works
Black-Clawson Company
Davis, Frank H., Co.
Murray, D. J., Mfg Co.
Moore & White Co.
Potdevin Machine Co.
Shartle Brothers Machine Co.
John Waldron Corp.
Weber, Herman G.

PENSTOCKS
Rodney Hunt Machine Co.

PERFORATING MACHINES
Dietz Machine Works
Waldron John, Corp.

PERFORATED METAL
Chase Brass & Copper Co.
Harrington & King Perforating Co.
Hendrick Mfg. Co.

pH TESTERS AND CONTROL
Leeds & Northrup Company
Wallace & Tiernan, Co., Inc.
Wilkens-Anderson Co.

PHOSPHATE CONTROL EQUIPMENT (Boiler Water)
W. A. Taylor & Co., Inc.

PILLOW BLOCKS
Link Belt Company

PIPE
Chase Brass & Copper Co.
The Cooper Alloy Foundry Co.
Duriron Company
Grinnell Company
The International Nickel Co.
T. B. Wood's Sons Co.
Crane Co.
Goodrich, B. B. Rubber Co.
Mundt & Sons, Charles
J. E. Singer
Walworth Co.

PLATES (Filter)
J. E. Singer
Stebbins Engrg. & Mfg. Co.

PIPING CONTRACTORS
Merritt-Chapman & Scott Corp.

PLATES (Floor)
American Pressed Steel Co.

PLATING, CHROMIUM
Chromium Corp. of America

PLATERS
Perkins & Son, Inc., B. F.

PLAYING CARD MACHINERY
Waldron, John, Corp.

PLUGS
Black-Clawson Company
Emerson Manufacturing Co.
E. D. Jones & Sons Co.
Shartle Brothers Machine Co.

POTENTIOMETERS
The Foxboro Company
Leeds & Northrup Company

POWER TRANSMISSION EQUIPMENT
Allis-Chalmers Mfg. Co.
Beloit Iron Works
Black-Clawson Company
De Laval Steam Turbine Co.
Farrel-Birmingham Co.
Link-Belt Co.
Moore & White Co.
Murray, D. J.
Westinghouse Electric & Mfg. Co.
T. B Wood's Sons
Worthington Pump & Mchy. Corp.

PRECISION INSTRUMENTS
The Bristol Co.
The Foxboro Company
Leeds & Northrup Company
Testing Machines, Inc.

PRESSES
Black-Clawson Company
Farrel-Birmingham Co.
Paper Converting Machine Co., Inc.
Potdevin Machine Co.
Shartle Brothers
Valley Iron Works
Waldron Corp., John

PRESSES (Dual Suction)
Beloit Iron Works

PRESS ROLLS
American Wringer Co., Inc
Beloit Iron Works
Black-Clawson Company
The Cincinnati Rubber Mfg Co.
Downingtown Mfg. Co.
Goodrich Rubber Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Montague Machine Co.
Perkins & Son, Inc., B. F.
Pusey & Jones Corp.
Rodney Hunt Machine Co.
Shartle Brothers
Stowe-Woodward, Inc.
Valley Iron Works

PRESSURE BULKERS
Perkins & Son, Inc., B. F.

PRINTING PRESSES
H. H. Heinrich, Inc.
Hudson Sharp Machine Co.
Potdevin Machine Co.
Paper Converting Machine Co., Inc.
Strachan & Henshaw, Ltd.
John Waldron Corp.
Weber, Herman G.

PULLEYS
Beloit Iron Works
Black-Clawson Company
Downingtown Mfg. Co.
Improved Paper Mchy. Corp.
E. D. Jones & Sons Co.
Link-Belt Co.
Montague Machine Co.
D. J. Murray Mfg. Co.
Shartle Brothers Machine Co.
Valley Iron Works
T. B. Wood's Sons

PULPSTONES
Norton Co.

PULPS
Andersen Co, J.
Bulkley Dunton Pulp Co., Inc.
Gottesman & Co., Inc.
Lagerloef Trading Co.
Perkins-Goodwin Co.
Price & Pierce, Ltd.
Pulp Sales Corporation
Pulp and Paper Trading Co.
Stora Kopparberg Corp.

PULPERS
Bird Machine Company
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Improved Paper Mchy. Co.
E. D. Jones & Sons Co.
D. J. Murray Mfg. Co.
Midwest-Fulton Machine Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Stebbins Engrg. & Mfg. Co

PULP SCREENS
Bird Machine Company
D. J. Murray Mfg. Co.
Trimbey Machine Works

PULP THICKENERS
Bird Machine Company
Downingtown Mfg. Co.
D. J. Murray Mfg. Co.
Moore & White Co.
Shartle Brothers Machine Co.

PULP WASHERS
Oliver United Filters, Inc.

PULP WOOD MACHINERY
Montague Machine Co.

PULPWOOD STACKERS
Link Belt Co.

PUMP PRIMERS (Steam and Water Jet)
Valley Iron Works Co.

PUMP VALVE BALLS (Rubber)
Stowe-Woodward, Inc.

PUMPS
Allis-Chalmers Co.
Beloit Iron Works
Black-Clawson Company

WHERE TO BUY

Davis, Frank H., Co.
Dorr Company
Downingtown Mfg Co.
Duriron Company
Economy Pumping Machinery Co.
Frederick Iron and Steel Co.
De Laval Steam Turbine Co.
Midwest-Fulton Machine Co.
Moore & White Co.
Nash Engineering Co.
Oliver-United Filters, Inc.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works
Warren Steam Pump Co.
Worthington Pump & Mchy. Corp.

PYROMETERS (Roll)
The Bristol Co.
The Foxboro Company
Leeds & Northrup Company

RAG CUTTERS
Perkins & Son, Inc., B. F.
Testing Machines, Inc.

REAM COUNTERS
Hamblet Machine Co.

REBUILT MOTORS
Shartle Brothers Machine Co.

REBUILT PAPER MACHINERY
Davis, Frank H., Co.
Shartle Brothers

RECORDING INSTRUMENTS
The Bristol Co.
The Foxboro Company
General Electric Co.
Leeds & Northrup Company
Trimbey Machine Works
Westinghouse Electric & Mfg. Co.
Wilkens-Anderson Co.

RECOVERY SYSTEMS
The Babcock & Wilcox Co.
Chemical Construction Corp.
D. J. Murray Mfg. Co.
Pusey & Jones
Ross Engineering Corp., J. O.
Stebbins Eng. & Mfg. Co.
Swenson Evaporator Co.
Moore & White Co.
Rodney Hunt Machine Co.
Westinghouse Electric & Mfg. Co.
Worthington Pump & Mchy. Corp.

REELS
Beloit Iron Works
Black-Clawson Company
Downingtown Mfg. Co.
De Laval Steam Turbine Co.
Hudson Sharp Machine Co.
Moore & White Co.
Paper Converting Mch. Co.
Rodney Hunt Machine Co.
Shartle Brothers Machine Co.

REFINERS
Appleton Machine Co.
Bahr Bros.
Emerson Manufacturing Co.
E. D. Jones & Sons Co.
Murray, D. J. Mfg. Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
U.P.M. Kidder Press Co., Inc.
Valley Iron Works

REFRACTORIES
Norton Co.

REGULATORS
The Bristol Co.
Cash Company, A. W.
The Foxboro Company
General Electric Co.
Leeds & Northrup Company
Link Belt Company
Trimbey Machine Works

REWINDERS
Black-Clawson Company
Paper Converting Mch. Co.
Potdevin Machine Co.

ROD MILLS
Allis-Chalmers Co.
The Mine and Smelter Supply Co.
Murray, D. J. Mfg. Co.

ROLLS (Brass and Copper)
Black-Clawson Company
Chase Brass & Copper Co.
Rodney Hunt Machine Co.
Shartle Brothers Machine Co.

ROLLS (Bronze)
Chase Brass & Copper Co.
Rodney Hunt Machine Co.

ROLLS (Chilled Iron & Gray Iron)
Black-Clawson Company
Davis, Frank H, Co.
Farrel-Birmingham Co.
Improved Paper Mchy. Corp.
Lobdell Car Wheel Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works

ROLL COVERS
Continental Diamond Fibre Co.

ROLLS (Rubber or Rubber Covered)
American Wringer Co.
Beloit Iron Works
Black-Clawson Company
The Cincinnati Rubber Mfg. Co.
Davis, Frank H., Co.
B F. Goodrich Rubber Co.
Goodyear Tire & Rubber Co.
D. J. Murray Mfg. Co.
Downingtown Mfg. Co.
Improved Paper Mchy. Corp.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Montague Machine Co.
Shartle Brothers Machine Co.
Rodney Hunt Machine Co.
Stowe-Woodward, Inc.

ROLLS (Wooden)
Rodney Hunt Machine Co.

ROLL GRINDERS
Farrel-Birmingham Co.
Lobdell Car Wheel Co.
Montague Machine Co.
Simonds-Worden-White Co.

ROLL SLITTING MACHINES
Cameron Machine Co.
Langston Co., Samuel M.
Potdevin Machine Co.
U.P.M. Kidder Press Co., Inc.

ROLL STANDS
Cameron Machine Co.
Moore & White Co.
Potdevin Machine Co.
Shartle Borthers Machine Co.
U.P.M. Kidder Press Co., Inc.

ROLL WINDING MACHINES
Cameron Machine Co
Potdevin Machine Co.
U.P.M. Kidder Press Co., Inc.

ROOFING
Chase Brass & Copper Co.
J. E. Singer

ROPE DRIVES
Allis-Chalmers Mfg. Co.

RUBBER COVERING
Cincinnati Rubber Mfg. Co.
Manhattan Rubber Mfg. Co.
Stowe-Woodward, Inc.

RUBBER VALVES (Ball)
Shartle Brothers
Stowe-Woodward, Inc.

SALT
Pennsylvania Salt Mfg. Co.
Solvay Sales Corp.

SALT CAKE
American Cyanamid & Chemical Corp.
Gottesman Co.
Grasselli Chemical Dept. of Du Pont de Nemours & Co.
Pennsylvania Salt Mfg. Co.

SATURATING MACHINES
Beloit Iron Works
Black-Clawson Company
Moore & White Co.
Potdevin Machine Co.
Shartle Brothers Machine Co.
Waldron, John, Corp.
Weber, Herman G.

SAVEALLS
Bird Machine Company
De Laval Steam Turbine Co.
Dorr Company
Downingtown Mfg. Co.
Improved Paper Mchy. Corp.
Moore & White Co.
Oliver-United Filters, Inc.
Shartle Brothers Machine Co.

SAVE-ALL PANS
Continental Diamond Fibre Co.

SCALES
Testing Machines, Inc.

SCREEN DIAPHRAGMS
The Cincinnati Rubber Mfg. Co.
Goodrich Rubber Co., B. F.
E. D. Jones & Sons Co.
Manhattan Rubber Mfg. Co.
Stowe-Woodward, Inc.

SCORE TESTERS
Testing Machines, Inc.

SCREENS
Appleton Wire Works
Beloit Iron Works
Bird Machine Company
Davis, Frank H., Co.
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Harrington & King Perforating Co.
Hendrick Manufacturing Co.
Improved Paper Mchy. Corp.
E. D. Jones & Sons Co.
Link-Belt Co.
Montague Machine Co.
Moore & White Co.
Charles Mundt & Sons
D. J. Murray Mfg. Co.
Shartle Brothers Machine Co
Valley Iron Works Co.

SCREEN PLATE
Bird Machine Company
E. D. Jones & Sons Co.
D. J. Murray Mfg. Co.
Hendrick Mfg. Co.
Improved Paper Mchy. Corp.
Shartle Brothers Machine Co.

SHAFTS
E. D. Jones & Sons Co.

SHAFTS, COLLAPSIBLE WINDOWS
Moore & White Co.

SHAFT COUPLINGS
Midwest-Fulton Machine Co.

SHAFTS (Forged)
Moore & White
T. B. Wood's Sons

SHAKER PANELS
Continental Diamond Fibre Co.

SHEET MACHINE
Noble & Wood Machine Co.
Strachan & Henshaw, Ltd.
Williams Apparatus Co.

SHEET METAL WORK
J. E. Singer

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Montague Machine Co .
T. B. Wood's Sons Co.

SHELLS (Jordan)
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E. D. Jones & Sons Co.

SHOWER PIPES
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Moore & White Co.
Shartle Bros. Mch. Co.
Smith & Winchester Mfg. Co.

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Continental Diamond Fibre Co.

SILICATE OF SODA
American Cyanamid & Chemical Corp.
Diamond Alkali Company, (Standard Silicate Division)
Philadelphia Quartz Co.

SIZING
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Bennett, Inc.
Paper Makers Chemical Corp.
National Oil Products

SIZING PROCESS
American Bewoid Co.
Bulkley-Dunton Pulp Co., Inc.
Bennett, Inc.
J. B. Calva & Co.
Eppenbach, Inc.
National Oil Products Co.
Ross Engrg. Corp., J. O.

SLIME ELIMINATION
Wallace & Tiernan Co., Inc.

SLIME REMOVER
Magnus Chemical Co.
National Oil Products Co.

SLITTERS AND REWINDERS
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Beloit Iron Works
Black-Clawson Company
Cameron Machine Co.
Dietz Machine Works
Downingtown Mfg. Co.
Hamblett Machine Co.
Langston Co., Samuel M.
Moore & White Co.
Potdevin Machine Co.
Smith & Winchester Mfg. Co.
Strachan & Henshaw, Ltd.
U.P.M. Kidder Press Co., Inc.
Waldron Corporation, John

SLUICE BARS
Continental Diamond Fibre Co.

SMOKE DENSITY INDICATING RECORDERS
Leeds & Northrup Company

SO_2 RECORDERS
Leeds & Northrup Company

SODA ASH
American Cyanamid & Chemical Corp.
Columbia Alkali Corp.
Diamond Alkali Company
Paper Makers Chemical Corp.
Pennsylvania Salt Mfg. Co.
Solvay Sales Corp.

SOAP POWDER
Magnus Chemical Co.
Paper Makers Chemical Corp.

SODIUM METASILICATE
Philadelphia Quartz Co.

SODIUM SULPHATE
American Cyanamid & Chemical Corp.
Pennsylvania Salt Mfg Co.

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Appleton Machine Co.
Beloit Iron orks
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Downingtown Mfg. Co.
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Eppenbach, Inc.
Farrel-Birmingham Co.
Hamblet Machine Co.
Hudson Sharp Machine Co.
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Shartle Brothers Machine Co.
Strachan & Henshaw, Ltd.
John Waldron Corp.

SPECIALTY DEVELOPMENT
J. B. Calva & Co.

SPEED INDICATING RECORDERS
The Bristol Company
Leeds & Northrup Company

SPEED REDUCERS
Beloit Iron Works
De Laval Steam Turbine Co
Farrel-Birmingham Co.
Rodney Hunt Machine Co.
Link-Belt Co.
Midwest-Fulton Machine Co.
Westinghouse Elec. & Mfg. Co.
Worthington Pump & Mch. Corp.

SPROCKETS
Improved Paper Mchy. Corp.
Link-Belt Co.

STAIR and FLOOR TILES—(Non-Slip)
Norton Compar

STAIR TREADS
American Pres d Steel Co.
Chase Brass & opper Co.
Hendrick Mfg. Co.
Norton Company

STARCH
American Cyanamid & Chemical Corp.
Clinton Co.

STEAM FITS & PACKING BOXES
Shartle Brothers

STEAM SPECIALTIES
Cash Company, A. W.
Crane Co.
Stickle Steam Specialties Co.

STEEL
Duriron Company
International Nickel Co.
Timken Roller Bearing Co.

STEEL PLATE CONSTRUCTION
Hendrick Mfg. Co.
Link-Belt Co.
Ross Engrg. Corp., J. O.

STOCK CUTTERS
Perkins & Son, Inc., B. F.

WHERE TO BUY

STOKERS
Babcock & Wilcox Co.
The Frederick Iron & Steel Co.
Link-Belt Co.
Swenson Evaporator Co.
Westinghouse Elec. & Mfg. Co.

STOCK REGULATORS
Trimbey Machine Co.

STRAW MAKING MACHINERY
Samuel H. Langston Co.

STUFF CHESTS
Downingtown Mfg Co.
Hauser Stander Tank Co.
Improved Paper Mchy. Corp.
E. D. Jones & Sons Co.
Midwest-Fulton Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Valley Iron Works Co.
G. Woolford Wood Tank Mfg. Co.

STUFF PUMPS
Beloit Iron Works
De Laval Steam Turbine Co.
Downingtown Mfg. Co.
The Frederick Iron & Steel Co.
Moore & White Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works
Warren Steam Pump Co.

SUCTION BOXES
Black-Clawson Company
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Shartle Brothers Machine Co.
Trimbey Machine Co.

SUCTION BOX COVERS
Beloit Iron Works
Black-Clawson Company
Continental Diamond Fibre Co.
Emerson Manufacturing Co.
E. D Jones & Sons Co.
Moore & White Co.
Shartle Brothers Machine Co.
Westinghouse Electric & Mfg. Co.

SUCTION ROLLS
American Wringer Co.
Beloit Iron Works
Black-Clawson Company
Downingtown Mfg. Co.
Goodrich Rubber Co., B. F.
Stowe-Woodward, Inc.

SULPHUR
American Cyanamid & Chemical Corp.
Texas Gulf SulphurCo.

SULPHUR BURNERS
Chemical Construction Corp.
Chemi.-Pulp Process
Valley Iron Works

SUPER CALENDERS
Beloit Iron Works
Farrel-Birmingham Co.
Lobdell Car Wheel Co.
Moore & White Co.
Norwood Engrg. Co.
Perkins & Son, Inc., B. F.
Smith & Winchester Mfg. Co.

SYPHONS (Flexible)
Midwest-Fulton Machine Co.

TABLE ROLLS
American Wringer Co
Beloit Iron Works
Black-Clawson Company
Goodrich Rubber Co., B. F.
Rodney Hunt Machine Co.
The Cincinnati Rubber Mfg. Co.
Stowe-Woodward, Inc.

TACHOMETERS
The Bristol Co.
The Foxboro Company
Leeds & Northrup Company
Testing Machines, Inc.

TANKS
Babcock & Wilcox Co.
Cincinnati Rubber Mfg. Co.
Continental Diamond Fibre Co.
Hauser Stander Tank Co.
Hendrick Mfg. Co.
The Jeffrey Manufacturing Co.
E. D. Jones & Sons Co.
Kalamazoo Tank & Silo Co.
The Manhattan Rubber Mfg. Co.
J. O. Ross Engrg. Corp.
Stebbins Engrg. & Mfg. Co.
Waldron Corp., John
G. Woolford Wood Tank Mfg. Co.

TEAR TESTERS
Testing Machines, Inc.

TELEMETERS
The Bristol Company
The Foxboro Company
Leeds & Northrup Co.

TELETYPE MACHINES
American Tel. & Tel. Co.

TEMPERATURE RECORDERS
The Bristol Co.
The Foxboro Company
Leeds & Northrup Company

TENSILE TESTERS
Perkins & Son, Inc., B. F.
Testing Machines, Inc.

TESTERS (Bursting Strength)
Perkins & Son, Inc., B. F.
Testing Machines, Inc.

TESTERS (pH)
Leeds & Northrup Company
Wallace & Tiernan Co., Inc.
Wilkens-Anderson Co.

TESTING LABORATORY
J. B. Calva & Co.
E. I. du Pont de Nemours & Co., Inc.

TESTERS (SMOOTHNESS
Testing Machines, Inc.

TESTERS (STIFFNESS)
Testing Machines, Inc.

TESTING INSTRUMENTS
Testing Machines, Inc.

THICKENERS
Bird Machine Company
Dorr Co.
Downingtown Mfg. Co.
Emerson Mfg. Co.
Improved Paper Mchy. Corp.
Moore & White Co.
D. J. Murray Mfg. Co.
Oliver-United Filters, Inc.
Shartle Brothers Machine Co.

TITANIUM PIGMENT
Chemical & Pigment Co.
Titanium Pigment Co.
R. T. Vanderbilt Co.

TIE RODS
International Nickel Co.

TOILET FOLDING MACHINES
Hudson Sharp Machine Co.
Paper Converting Machine Co., Inc.

TOILET WINDERS
Cameron Machine Co.
Dietz Machine Works
Hudson Sharp Machine Co.
Paper Converting Mch. Co.

TOWEL FOLDING MACHINES
Paper Converting Machine Co., Inc.
Waldron Corp., John

TOWEL INTERFOLDING MACHINES
Dietz Machine Works
Hudson Sharp Machine Co.
Paper Converting Mch. Co.

TOWEL WINDER
Cameron Machine Co.
Hudson Sharp Machine Co.
Paper Converting Mch. Co.
Waldron Corp., John

TOWERS
Cameron Machine Co
Hudson Sharp Machine Co.
Stebbins Engrg. & Mfg. Co.
Waldron Corp., John

TRANSMISSION MACHINERY
Appleton Machine Co.
Beloit Iron Works
Black-Clawson Company
De Laval Steam Turbine Co.
Farrel-Birmingham Co.
Link-Belt Co.
Shartle Brothers Machine Co.
Timken Roller Bearing Co.
T. B. Wood's Sons
Worthington Pump & Mchy. Corp.

TRAPS (Steam)
Crane Co
Grinnell Company
Midwest Fulton Mch. Co.
Stickles Steam Specialties Co.

TREADS (Stair)
American Pressed Steel Co.
Norton Company
U. S. Rubber Products Co.

TRUCKS
Baker-Raulang Co.
Moore & White Co.
Towmotor Company
Revolvator Company

TUBES (Paper)
Elixman Paper Core Co.
Sonoco Products Co.

TUBING
Chase Brass & Copper Co.
The International Nickel Co.
Timken Roller Bearing Co.

TUBS
De Laval Steam Turbine Co.
Rodney Hunt Machine Co.
G. Woolford Wood Tank Mfg. Co.

TURBINES (Water)
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
Rodney Hunt Machine Co.
Westinghouse Electric & Mfg. Co.
Worthington Pump & Mchy. Corp.

TURBO-GENERATORS
Allis-Chalmers Mfg Co.
Chicago Electric Co.
De Laval Steam Turbine Co.
Westinghouse Electric & Mfg. Co.
Worthington Pump & Mchy. Corp.

USED EQUIPMENT
Consolidated Products Co.
Gibbs-Brower Co.
Shartle Brothers Machine Co.

VALVES
The Bristol Company
Cash Company, A. W.
The Cooper Alloy Foundry Co
Crane Co.
Duriron Company
The Foxboro Company
E. D. Jones & Sons Co.
D. J. Murray Mfg. Co.
Shartle Brothers Machine Co.
Trimbey Machine Works
Walworth Co.

VENTILATING SYSTEMS
J. O. Ross Engrg. Corp.

VULCANIZERS
H. H. Heinrich, Inc.

WASHERS
Bird Machine Company
Downingtown Mfg. Co.
Improved Paper Mchy. Corp.
E. D. Jones & Sons Co.
Moore & White Co.
Oliver-United Filters, Inc.
Swenson Evaporator Co.

WASHERS (Felt, Endless)
Rodney Hunt Machine Co.

WASHER CYLINDERS
Midwest-Fulton Machine Co.

WASHING ENGINES
Emerson Manufacturing Co.
Midwest-Fulton Machine Co.

WATER ANALYSIS EQUIPMENT
Wilkens-Anderson Co.

WATER WHEELS
Rodney Hunt Machine Co.

WAXING MACHINERY
Beloit Iron Works
Black Clawson Co.
Improved Paper Mchy. Co.
Potdevin Machine Co.
Shartle Brothers Machine Co.
Strachan & Henshaw, Ltd.
Waldron, John, Corp
Weber, Herman G.

WAX SIZE
American Cyanamid & Chemical Corp.
Bennett, Inc.
National Oil Products Co.
Paper Makers Chemical Corp.

WELDING
Grinnell Company
Westinghouse Electric & Mfg. Co.

WHEATSTONE BRIDGES
The Brown Instrument Co.
Leeds & Northrup Company

WET MACHINES
Bagley & Sewall Mfg. Co.
Beloit Iron Works
Black Clawson Co.
Downingtown Mfg. Co.
Improved Paper Mchy. Corp.
Moore & White Co.
Montague Machine Co.
Pusey & Jones Corp.
Smith & Winchester Mfg Co.
Valley Iron Works

WINDERS & REWINDERS
Bagley & Sewall Mfg. Co.
Beloit Iron Works
Black-Clawson Company
Cameron Machine Co.
Davis, Frank H., Co.
Dietz Machine Works
Downingtown Mfg. Co.
Langston Co., Samuel M.
Moore & White Co.
Paper Converting Mch. Co.
Potdevin Machine Co.
Pusey & Jones Corp.
Smith & Winchester Mfg. Co.
Strachan & Henshaw, Ltd.
The Textile Finishing Machy. Co.
U.P.M. Kidder Press Co., Inc.
John Waldron Corp.

WIRES
Appleton Wire Works
Chase Brass & Copper Co.
Improved Paper Mchy. Corp.
International Wire Works
Lindsay Wire Weaving Co.

WIRE CLEANERS
Magnus Chemical Co.

WIRE CLOTH
Chase Brass & Copper Co.
International Nickel Co.
Oliver-United Filters, Inc.

WIRE GUIDES
Moore & White Co.
John Waldron Corp.

WIRE GUIDE ROLLS
American Wringer Co.
Goodrich Rubber Co., B. F.
Stowe-Woodward, Inc.

WIRE STRETCH ROLLS
American Wringer Co.
Stowe-Woodward, Inc.
Valley Iron Works

WOOD PULP IMPORTERS
Stora Kopparberg Corp.

WOOD ROLLS
Rodney Hunt Machine Co.

WOOD SPLITTERS
D. J. Murray Mfg. Co.
Moore & White Co.

WOOD TANKS
Hauser Stander Tank Co.
G. Woolford Wood Tank Mfg Co.
Rodney Hunt Machine Co.

WORMED CUTTERS
American Wringer Co.
The Cincinnati Rubber Mfg Co.
Stowe-Woodward, Inc.

WRENCHES
Walworth Co.

WRENCHES (Ratchet)
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